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BULLETIN
OF THE
BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XI FEBRUARY, 1916 No. 1

A LIST OF THE FAMILIES OF COLEOPTERA IN AMERICA, NORTH OF MEXICO.

By Charles W. Leng, 33 Murray St., N. Y. City.

The following list is based on the work of Brues and Melander ("Key to the Families of North American Insects," 1915), with some corrections, the authorities for which are given in the notes. It is published at this time in the hope of eliciting such comment from the students of the Coleoptera that, in the event of a new Check List being published, the materials for a satisfactory arrangement of the families, after free discussion by those interested, may be available. It may be added that the work on which the list is based, for which we are most grateful to the authors, gives the definition of the family names employed, and is stated to be in turn based on the works of Sharp and Ganglbaur; and that it coincides, in the main, with the "Catalogus Coleopterrorum" of Junk, as far as that work has been completed. The differences between its classification and that of Leconte and Horn, repeated in Henshaw's Check List, are the result of the studies during the last forty years of a host of Coleopterists, who have corrected conclusions derived by Leconte, mainly from consideration of the external adult characters, by studies of the larvæ in some families and by studies of the fossil insects in others; as well as by studies in some groups of the internal anatomy. The differences are not always very great, consisting often in treating Leconte's subfamilies as families or vice versa, or in changes in the relative position of the families. Of such changes in position, the greatest is in according the highest rank to the beetles with lamellate antennæ, a course which most readers are probably already prepared to adopt, except possibly as it affects the relative position of the Rhynchophora.

The Rhynchophora were regarded by Leconte practically as a suborder, strongly differentiated by the rigid palpi, single gular suture, legless larvæ and, usually, by the beak. A continuance of this division would still permit of ending the Coleoptera genuina with the heteromerous, phytophagous and lamellicorn series in successively advanced rank, and avoid interpolating the Rhynchophora between them. Furthermore the Rhynchophora as a suborder would be more logically connected through the Brenthidæ with the Rhysodidæ of the Adephagous series, and through the Anthribidæ with the Bruchidæ of the Phytophagous series, than they would be if regarded as merely a series of equal taxonomic value with other series. I should therefore personally prefer to transpose the position of families 90 to 93 so that they would follow families 94 to 97, but separated as a suborder so as to leave the Scarabæidæ at the end of Coleoptera genuina.

On this as well as on the minor points covered by the notes I shall be glad to receive the comment of the reader. No such changes, however based purely on personal opinion, have been here made; the arrangement of the families follows that of Brues and Melander except as noted below where there is a conflict of authorities.

ORDER COLEOPTERA

SUBORDER *ADEPHAGA*

1. Carabidæ[1]
2. Haliplidæ
3. Amphizoidæ
4. Dytiscidæ
5. Gyrinidæ
6. Rhysodidæ
7. Cupedidæ[2]

SUBORDER *POLYPHAGA*

Series PALPICORNIA

8. Hydrophilidæ

Series Staphyliniformia

9. Silphidæ
10. Scydmænidæ
11. Leptinidæ
12. Clambidæ
13. Orthoperidæ[3]
14. Ptiliidæ[4]
15. Sphæriidæ
16. Hydroscaphidæ
17. Scaphidiidæ
18. Platypsyllidæ
19. Staphylinidæ
20. Pselaphidæ
21. Histeridæ

Series Malacodermata

22. Lycidæ
23. Lampyridæ
24. Telephoridæ
25. Malachiidæ
26. Melyridæ[5]
27. Cleridæ
28. Corynetidæ
29. Derodontidæ

Series Cucujoidea

30. Cucujidæ

Series Clavicornia

31. Trogositidæ[6]
32. Nitidulidæ
33. Rhizophagidæ[7]
34. Erotylidæ
35. Mycetæidæ
36. Cryptophagidæ
37. Phalacridæ
38. Lathridiidæ
39. Tritomidæ[8]
40. Monœdidæ[9]
41. Colydiidæ
42. Cioidæ
43. Sphindidæ
44. Endomychidæ
45. Coccinellidæ

Series Brachymera

46. Byturidæ
47. Dermestidæ
48. Nosodendridæ
49. Byrrhidæ

Series Macrodactylia

50. Georyssidæ
51. Heteroceridæ
52. Helodidæ
53. Eucinetidæ
54. Parnidæ[10]

Series SERRICORNIA

55. Chelonariidæ
56. Dascillidæ
57. Rhipiceridæ

Series STERNOXIA

58. Cebrionidæ
59. Elateridæ
60. Eucnemidæ
61. Throscidæ

Series BUPRESTOIDEA

62. Buprestidæ

Series TERIDILIA

63. Lymexylonidæ
64. Micromalthidæ
65. Bostrichidæ
66. Lyctidæ
67. Ptinidæ
68. Anobiidæ

Series HETEROMERA

69. Oedemeridæ
70. Cephaloonidæ
71. Pythidæ
72. Pyrochroidæ
73. Hylophilidæ
74. Pedilidæ
75. Anthicidæ
76. Melandryidæ
77. Scraptidæ
78. Monommidæ
79. Othniidæ
80. Aegialitidæ
81. Lagriidæ
82. Alleculidæ[11]
83. Tenebrionidæ
84. Meloidæ
85. Mordellidæ
86. Rhipiphoridæ

Series PHYTOPHAGA

87. Cerambycidæ
88. Chrysomelidæ
89. Bruchidæ

Series RHYNCHOPHORA

90. Brenthidæ
91. Anthribidæ[12]
92. Curculionidæ
93. Scolytidæ[13]

Series LAMELLICORNIA

94. Lucanidæ
95. Sinodendridæ
96. Passalidæ
97. Scarabæidæ[14]

ORDER STREPSIPTERA

98 Xenidæ[15]

1. Cicindelidæ of Henshaw's Check List are included as a subfamily of Carabidæ in accordance with Dr. Walther Horn's work in Genera Insectorum.

2. Cupedidæ is the spelling used in recent works in place of Cupesidæ.

3. Orthoperidæ is equivalent to Corylophidæ as far as our fauna is concerned. A family called Aphenocephalidæ, Pseudocorylophidæ or Discolomidæ by different authors is, however, separable in tropical America and may possibly be found in southern Florida at some future time.

4. Ptiliidæ is used in recent works instead of Trichopterygidæ.

5. Melyridæ are separated as a family by Col. Thomas L. Casey (Ann. N. Y. Ac. Sci., VIII, 456) and the excellent reasons given appear to have been overlooked.

6. The family Trogositidæ has been called Temnochilidæ by most recent authors; also Ostomidæ and Ostomatidæ; and has been by some divided into two families. Until the promised revision by Mr. Charles Schaeffer appears, it seems best to retain the name used in the Henshaw Check List.

7. The Rhizophagidæ are treated as a separate family by A. Méquignon in the Junk Catalogue and are omitted by A. Grouvelle in his treatment of the Nitidulidæ.

8. Tritomidæ is used instead of Mycetophagidæ following Casey (Journ. N. Y. Ent. Soc., VIII, 1900).

9. Monœdidæ is used instead of Adimeridæ because Monœdus Horn has precedence over Adimerus Sharp.

10. The name Parnidæ is retained because there has been much argument as to the validity of Dryops, the priority of which name has led many to call the family Dryopidæ.

11. The name Alleculidæ is used by F. Borchmann in the Junk Catalogus, following Seidlitz instead of Cistelidæ.

12. The name Anthribidæ may have to be changed on grounds of priority; but it seems best to await the completion of the studies of Dr. W. Dwight Pierce in the synonymy of the Rhynchophora.

13. Dr. A. D. Hopkins has shown that Scolytidæ (not Ipidæ) is the proper name for this family; and that Platypodidæ of many authors is more correctly treated as a subordinate division.

14. The Trogidæ are separated as a family by Brues and Melander; but, being treated as a subfamily of Scarabæidæ by Mr. Gilbert J. Arrow in the Junk Catalogus, the same course is here followed.

15. The Xenidæ are equivalent to Dr. Leconte's Stylopidæ and are included for that reason though not Coleoptera.

THE WEAVER OF THE WEB.

By R. P. Dow, Brooklyn, N. Y.

It is hardly conceivable that there is any human art older than that of weaving, and for it Mistress Spider (the male spider toils not, neither does he spin) has stood prototypical always. A word to describe the process must be as old as the process itself and it has never changed greatly. The word web is merely the past participle of the verb, to weave. The spider is called in the Sanscrit language *urnavabi,* a compound, wool-weaver. It is but a step from *vab* to *web.* The corresponding Greek word is *huphè.* The Greeks did not retain the idea of wool in the spider's name, although their garments were for the most part woolen. It would seem that in primitive India cotton had not replaced wool.

The Greeks called the spider *arachne.* This is the spelling of Homer. Hesiod and Pindar spelled it *arachnes.* In the works of Aeschylus it became *arachnos.* In all later Greek it was again *arachne.* The Latin makes a direct step to *aranea.* The Germanic peoples took a different root, although keeping the original one to indicate weaving. Spider is merely *spindler.* A spindle is the stick on which the thread is wound, becoming slendered as thread is drawn into warp or woof. The word thread has no relation to the spider. It means *that which is drawn* and is akin to the Latin *traho.*

The word *arachne* did not originate in Greece. Nor did it at first refer to the spider. There is an Indo-Germanic root, *ark.* It seems to mean a completely covered receptacle to serve as a hiding place either for a person or thing. As *arcanum* it still retains this idea. As *arcane* it differs. It is the two parallel bars of wood to which the weavers fastened their threads. Perhaps it developed into a more elaborate loom, far more serviceable than hand weaving. If this be so, it would explain the myth of Arachne, which, while recorded by late poets, is as old as Greece, if not older.

Arachne was a maiden, the most skilful weaver (or, more probably embroiderer) in Greece. She dared to compete with the Goddess Athene herself and spread upon her web remarkable tapestry effects depicting the failings of the Gods. By all accounts her work compared well with that of the Goddess, but who can stand against high Olympus? A tap of Athene's wand and the mortal became a spider and her handiwork the radiating web the centre of which was to be her perpetual home.

A spider gave the central idea of the great Homeric poem, the Odyssey. The essential word here is *penizo,* which seems to mean weaving in some way that is easily unraveled, perhaps knitting. Penelope is the spider-eyed weaver, who stays at home constructing each day a work to be undone each night. Odysseus was the wanderer, the typical male of the species.

When Xenophon spoke of what is undoubtedly a spider he used the word *phalanx.* Aristotle recognizes two groups of spider, *arachnæ* and *phalangia,* the latter including the harvestmen still known as Phalangidæ, having long legs. Here, then, is an entirely different metaphor, accentuating the eight legs and two mandibles. The word *phalanx* (plural *phalangai*) has had a curious career. Its first significance is the ten fingers of the two hands. By Homer's time it was restricted to ten particular joints in the hands, as it is now. In the singular, *phalanx,* Homer uses the word to mean a body of men in close array for offence and defence, so combined to remind one of two hands with ten extended fingers. This significance has ever since clung to the word.

In the nebulous portion of Greek antiquity some huge octopus, perhaps not unlike those still inhabiting the northern seas but long extinct in the Mediterranean, came to that shore and found victims enough to make it long remembered. Some eye witness, describing the creature, used his two hands with extended fingers as an illustration. It was like a huge phalanx, he said. Thus it came to have a name—phalæna. The name became applied to the next sea monster. The whale, also, has been extinct in the Mediterranean during all historic time, but the ancestors of the Romans remembered the creature and adopted the Greek name as *balæna.* Of that particular *balæna* whose enforced guest was the Hebrew, Jonah no acquaintance could be more desirable.

The original *phalæna* was a devastator from the sea. The Greeks passed the name on to a land devastator which, collectively, destroyed whole fields of crops. Its nature would be unknown had not Hesychius, an Alexandrian grammarian of uncertain date, explained that it developed into a Psyche—a Lepidopterous insect. Surely, then, it was the larva of Noctuid or Geometrid, probably the cut worm spreading in as many directions as ten fingers can point.

The apparently ten-legged spider stands as a symbol for the basis of all arithmetical computation. Ten thousand years before the Arabic numerals were invented the only way that the shepherd could tell the tale of his flock was by his fingers. Large sums became multiples of the phalangia. The Zend people, 6,000 years B. C., were so simple that they could only count in this way. To describe a rich man the Avesta spoke of him as owning 1,000 Bactrian camels, 1,000 horses, 1,000 cattle, and 10,000 sheep. This last is beyond the counting power of the shepherd. The princely warrior could conceive only one greater number and he was compelled to call that "innumerable." He prayed to the Goddess of the Irans that he might slay of the Turan enemy—of those who had slain 10 he might slay 100, of those who had slain 100 he might slay 1,000; of the thousand killers that he might slay 10,000; and of the myriad slayers that he might slay innumerable. When the armies of Xerxes assailed Greece their numbers transcended imagination. They could only be computed in the next phalangic multiple, millions. In all the ancient battles the victors claimed the dead were in myriads or multiples of the phalangic unit.

The phalangic unit describes the ant, which is the *mike* of the older Zend, the name amplified by the statement that it occurs in colonies too numerous to be counted. *Muria* plus *mike* became *myrmex*. The Romans, losing sight of the root meaning of the word, translated it phonetically as *formica*. The two English words, which seem to be synonyms, are *emmet* (of which *ant* is a mere contraction) and *pismire*. This is a compound word. The last syllable was carried away in Indo-Germanic times and is *muria*, ten thousand. The first syllable is due to the habit of certain species of ejecting formic acid when put on the defensive.

Aristotle (331 B. C.) attempted a little personal observation of spiders and has this to say: "All web-spinning spiders unite thus: The female draws a thread from the middle of the web and the male draws it back again. This they do many times until they meet and unite back to back, this method of copulation suiting them because of the size of their abdomens. They produce small maggots which metamorphose into spiders, not from a part but from the whole of the maggot, for they are round from the first. When the female has produced her ova she incubates on them, and in three days they acquire legs. All species produce their young in a web, some kinds thin and small, others compact. Some are entirely enclosed in a round receptacle, others only partially covered by web. All the young are not produced simultaneously, but as soon as they are hatched each leaps out, exuding a thread of its own. If bruised their contents is found to be a thick white fluid like that of maggots.

"The field spiders first of all deposit their ova in a web, one end attached to their body and the other free, and they incubate thereon, producing the young alive. The *phalangia* weave a thick basket in which they lay their eggs and over which they incubate. The smooth kinds produce a small number of offspring, the *phalangia* proper many. When grown the young surround the parent, kill her and throw her out. They often seize the male in the same way, when opportunity comes while he is assisting the female in incubation. Sometimes there are as many as 300 young in a single brood. They become full grown in about four weeks.

"There are many kinds of *arachnia* and *phalangia,* two of the latter which bite. One is called *psylla* and resembles those known as *lykoi* (wolves). It is small, variegated, pointed and an active jumper. The other is black, larger and with long forelegs. It moves slowly and can scarcely walk, being neither strong nor able to jump.

"There is another group of those called *wolves,* one species of which is small and makes no web. Another species is larger and makes a coarse web of inferior quality on the ground or in hedges. If on the ground it is over a chink in the soil with the apex of its funnel extending downward. Here the spider keeps guard, running out whenever something falls within reach. The variegated kind makes a small inferior web in trees. There is a third species which is exceedingly skillful and graceful. This begins the weaving operation by extending threads in all directions so far as the web is to cover. It then determines the center accurately, and from this point starts with a new thread, weaving, so to speak, the woof which is to connect all the threads of the warp. Its sleeping place and store room are put at some little distance. It watches for prey at the web center. An insect caught anywhere stirs the center, whereupon the spider surrounds and encloses it with web tissue until it becomes resistless. Then it is carried to the store room. If hungry the spider sucks the victim at once, for this is the way she takes her food. If not, she hurries back to wait for more prey, stopping only to mend the tears in the web. If in her absence any new victim has become entangled she goes first to the center of the web, thence as before to the attack. If her web be destroyed, she begins spinning another at sunset, for then prey is most abundant. Only the female makes webs and catches prey. The male merely enjoys it with her.

"There are two species of the graceful spiders which spin thick webs, one large and one small. The long-legged kind watches from above the web so as not to alarm a creature which would otherwise fall in. This is because her size prevents her from being inconspicuous. The smaller kind hides in a little upper chamber.

"Spiders have the power of ejecting web material as soon as they are born. The tissue does not come from within their bodies, as Democritus asserts, but from the surface, like the bark of a tree or the quills of a porcupine.

"Spiders will attack and surround with web animals much larger than themselves, even small lizards. They first enweb the mouths of their victims, then approach and bite. The ichneumons and the gecko lizards are great enemies of the spider."

While Aristotle's observations are sometimes far from accurate, he did pretty well for a pioneer. Nicander of Cos studied the subject a century or so later. He catalogued thirty species of spiders, treating of their use in medicine. His written work is lost, but we have the testimony of Pliny, the Roman, on the subject.

TWO NEW BEES FROM NEW JERSEY.

By T. D. A. Cockerell, Boulder, Colo.

Halictus floridanus caesareus subs. nov.—♀. A little smaller; face and front dark blue, the clypeus shining; mesothorax blue-black, densely and finely punctured, dull; scutellum somewhat shining, purple-blue; area of metathorax blue-black; abdomen without metallic tints. As in *H. floridanus* Rob., the head is oval, with a narrow face, and the hind spurs have extraordinarily long spines.

Hab.—Ocean Grove, N. J., July 12, 1893; collector unknown. The name is derived from the ancient name of Jersey. This looks like a distinct species, but it agrees in structure with a specimen of *H. floridanus* received from Robertson, though the color is very different.

Halictus oceanicus sp. nov.—♀. Length about 6.5 mm.; robust, rather dark blue-green, with dull white hair; tegulæ rufopiceous, well punctured on anterior half, rounded behind; wings hyaline, conspicuously suffused with reddish, stigma and nervures ferrugineous; areas of metathorax with very coarse rugæ; posterior truncation very sharply margined; abdomen dark green, shining, polished, hind margins of segments suffusedly reddish, fourth segment rather thinly covered with white hair; hind spur with long spines. Closely related to *H. nymphœarum* Rob., but differing thus: Areas of metathorax with fewer rugæ, wings reddish, abdomen strongly metallic; both head and thorax distinctly narrower. It is, perhaps, a subspecies of *nymphœarum*, but if so a very distinct one.

Hab.—Ocean Grove, N. J., July 12, 1893; collector unknown.

THE GENUS PLEOCOMA.

By Alonzo Davis, Pasadena, Cal.*

This genus, in all its members, is very rare and also very peculiar. Their mouth parts are quite undeveloped and they can take no nourishment, so consequently they live but a few days. After the first rain of the year that soaks down into the ground far enough to loosen the earth where they are, the beetles come to the surface. The males come out and fly but the females simply open a passage to the surface, staying in the ground. The males come and find them.

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* This paper was submitted by the writer as a composition in the regular course of grammar-school work. The writer is one of the phalanx of youths who support the three active natural history societies of the vicinity and gather to the aid of the entomological department of the Southwest Museum of Los Angeles.

Little or nothing is known of the life histories of these beetles. They live almost wholly underground, and are always found in mountains. There are, as I have been able to find out, ten species of these beetles, all living in California or the West Coast. They are as follows:

P. fimbriata Lec. Found in the middle Sierras.
P. Behrensi Lec. In the mountains around San Francisco Bay.
P. Rickseckeri Horn. Mountains north of San Francisco.
P. hirticollis Schauf. Is found in the same locality.
P. conjungens Horn. In the Santa Cruz Mountains.
P. Ulkei Horn. Is found in Utah.
P. staff Schauf. Is found in Oregon.
P. australis Fall. Sierra Madre Mountains.
P. Hoppingi Fall. In the San Joaquin Mountains.
P. puncticollis Rivers.

There has been a stray elytra picked up in the Santa Cruz (?) Mountains which might prove to be from a new species, but nobody can tell much from just one wing cover.

I found three specimens of a Pleocoma on the Mt. Wilson trail on Dec. 19, 1914. They may be a new species. They are now in the possession of Prof. H. C. Fall, who has named two new species of the genus. They were all males. If I had not at that time been ignorant of the habits of the genus, I undoubtedly could have gotten some females, as their holes were fairly thick in the trail.

They are apt to be found almost anywhere in the mountains, so it is well to be ready for them. I neglected to take my cyanide, as it was quite late for insects to be out, and as there was snow on the ground about half way up the mountain.

When I found the beetles I put two of them in a small tin box and the other I tied up in the corner of my handkerchief. Inside the box the beetles were having strenuous times. The smaller one pried the head and thorax off the big one, and so I took them all out, and came home with the three tied up in the corners of my handkerchief, as the box was pretty well squashed from my sitting on it during a snowball fight.

THREE NEW COLEOPTERA FROM WASHINGTON STATE.

By H. C. Fall, Pasadena, Cal.

Bembidium pugetanum n. sp. Form nearly as in *lorquini,* or the European *litorale,* viridiæneous, surface alutaceous, palpi and antennæ dark metallic, the latter with basal joint pale beneath, femora at base and tibiæ beneath pale.

Mentum tooth triangular. Prothorax one half wider than long, very slightly wider at base than at apex, sides moderately rounded in front and sinuate behind, narrowly margined; hind angles rectangular and a little prominent; disk evenly alutaceo-reticulate, with feeble traces of transverse wrinkles, hind angles with a short oblique carina; submedian marginal seta present. Elytra fully one half wider than the prothorax, striæ moderately punctate, the fourth not distinctly sinuate, intervals 2–4 with purplish black stripe, more extended on the third—on which are the usual two squarish impressions. Body beneath greenish black, shining.

Length 6 mm.; width 2.45 mm. (type ♂).

Described from two examples (♂ ♀) taken at Seattle, Washington, by Prof. O. B. Johnson.

This species, by the form of the mentum tooth, the presence of the median marginal seta of the prothorax, and the carinate hind angles of the latter, would in my table* be placed near *carinula,* which however it does not very much resemble. In *carinula* the prothorax is more strongly transverse, the surface lustre more or less cupreous.

Cafius johnsoni n. sp. Black, the inflexed margins of the elytra, legs, and ventral segments sometimes more or less brownish. Antennæ black, not reaching the middle of the prothorax, joints 5–10, gradually becoming a little wider than long. Head—exclusive of mandibles—squarish, often larger in the male, strongly shining, with a minute wavy strigillation which disappears at the middle of the disk, an externally arcuate series of three large punctures on each side of the disk, and two or three others at the hind angles. Prothorax subequal in width to the head, slightly longer than wide, sides parallel, surface throughout polished, each side of the middle a series of four punctures, the posterior one more distant, with a few similar coarse punctures anteriorly toward the sides. Elytra a little longer than the prothorax, evenly, closely, rather coarsely punctate; pubescence thin, dusky, inclined, and with several series of widely spaced longer erect setæ. Abdomen similarly thinly pubescent, the hairs more recumbent, punctuation finer than on the elytra; beneath more coarsely

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* Trans. Am. Ent. Soc., XXXVI, p. 94.

punctate than above, sixth segment of male with a moderately deep subequilateral triangular emargination. Front tarsi very slightly dilated, scarcely more evidently so in the male.

Length 6.5–7.5 mm. Seattle, Washington.

For the series in my cabinet I am indebted to Prof. O. B. Johnson, of the University of Washington. This is a very distinct species, quite different in general appearance from any other in our fauna; in fact its resemblance to certain species of *Philonthus*—such as *quadricollis* or *sordidus*—is much more marked. In its strongly shining head and prothorax it is only approached by *seminitens,* after which it should be placed, although really belonging to the group which follows, from all of which the highly polished prothorax will separate it.

Laricobius laticollis n. sp. A series of specimens from Seattle, Washington, differ so constantly in several respects from *L. erichsoni* that I have no hesitation in pronouncing them distinct. The form is perceptibly stouter than in *erichsoni,* the color above uniformly testaceous or rufotestaceous, head brownish piceous, body beneath black, the legs and propleuræ rufotestaceous. The prothorax is more strongly transverse than in *erichsoni,* and the erect hairs of the upper surface are shorter. There is no trace in any of the fourteen examples before me of the elytral, sutural and lateral blackish stripes so constant in *erichsoni.*

Length 2.25–2.5 mm. In *erichsoni* the length is seldom as great as 2.25 mm.

I am indebted to Prof. O. B. Johnson, who writes that they were taken from Douglas fir on the campus of the University of Washington, February and April. He has the species also from Columbia Gorge.

A NEW GENUS AND SPECIES OF HELOMYZIDÆ (DIPTERA).

By J. R. Malloch, Urbana, Ill.

The genus described herewith may be recognized as a helomyzid by the distinctly spined costa, the very small size of the calyptræ, the absence of tibial bristles except at apices, and by the venation. The vibrissæ are not differentiated. The first example of the species that was taken, a female, proved a puzzle to me, though I had no doubt as to its being a helomyzid. Being unable to place it in any genus known to me, I made an attempt to obtain the male, hoping that it would clear up certain points for me, and fortunately succeeded in obtaining a single specimen. Much as I deprecate the erection of genera for the reception of single species, there appears to be no way out of it in this case, as the combination of characters possessed by the species is not met with in any genus in the family, and its habitus does not correspond closely to that of any other except, in some respects, to that of *Heteromyza*. From *Heteromyza* it is readily separated by the very much more widely separated eyes of the male, the longer costal spines, and the absence of mesopleural bristles in both sexes. *Anarostoma* is the most closely related North American genus yet described, but its species have mesopleural bristles and, as is the case in all the other genera, the first vein ends proximad of the vertical line of the inner cross-vein or just in line with the latter instead of very distinctly distad of it as is the case in the present genus.

ANAROSTOMOIDES, n. gen.

Generic characters.—Male, female: eyes widely separated; orbits with 2 pairs of bristles; postvertical bristles small, cruciate; face retreating, upper mouth-margin not sharply defined; vibrissæ not well differentiated, represented by 2 weak hairs; cheeks almost subquadrate, nearly as high as eye; antennæ of moderate size, arista subpubescent. Bristles of disc of mesonotum irregular, the dorso-centrals consisting of 7 pairs, the anterior 2 pairs in front of suture;* humeral bristle present; mesopleura without bristles; sternopleura with 2 bristles on the upper posterior angle and numerous long hair-like bristles on the lower portion; scutellum with 6 bristles. First vein ending distinctly beyond the inner cross-vein.

Type of genus, *Anarostomoides petersoni,* n. sp.

Anarostomoides petersoni n. sp. *Male.*—Black, opaque, the ground-color everywhere obscured with dense grayish pruinescence. Frons slightly brownish or reddish anteriorly; face reddish testaceous; antennæ deep black; proboscis brown; palpi yellowish, darkened apically. Mesonotum with faint indications of a narrow brown vitta along the line of dorso-centrals. Legs not so densely pruinescent as the thorax, knees very narrowly reddish. Wings clear or slightly grayish, the veins black. Halteres testaceous, the knobs brownish yellow.

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* This may be an abnormal specimen, and possibly the usual number of dorso-centrals is 5 pairs.

Orbits not clearly differentiated, the whole frons opaque, lower orbital bristle slightly weaker than upper, both directed out over eye; surface of frons with numerous short black setulæ on anterior half; third antennal joint rounded apically; arista barely longer than width of frons, subpubescent, swollen at base. Acrostichal bristles irregular, about 3 rows between the dorso-centrals; disc of mesonotum with a few rather widely separated setulose hairs; mesopleura bare; pteropleura bare; scutellum bare on disc, with 6 marginal bristles. Abdomen slender; hypopygium of moderate size, recurved on venter. Legs rather strong, fore femora much incrassated, twice as thick as mid pair, their ventral surface covered with short, closely placed hairs and very short bristles; basal joint of fore tarsus much shorter than second, armed at its apex with a claw-like spur; mid and hind femora without bristles; fore and hind tibiæ each with a single weak preapical dorsal bristle; mid pair with about 6 apical bristles. Costa with numerous soft, short hairs and a series of distinct short bristles, an indistinct break in costa just proximad of the auxiliary vein, the latter joining costa in line with inner cross-vein; first vein joining costa but little proximad of a point midway between the cross veins; anal vein complete; outer cross vein about half its own length from wing margin.

Female.—Differs from the male in having the fore femora normal in form and with a number of long, curved, slender bristles on ventral surface; the basal joint of fore tarsus much longer than the second and unarmed apically; the mid femora with a number of short bristles on the anterior surface, and the preapical tibial bristles slightly stronger.

Length: male, 6 mm., wing, 6 mm.; female, 5 mm., wing, 5.5 mm.

Type locality, Urbana, Ill.; male, November 13, 1915 (J. R. Malloch); female, November 11, 1915 (A. Peterson),—both specimens taken in or near the Forestry of the University of Illinois. No data was obtained as to the habits of the species, but the male which I captured was taken close to the plot devoted to the culture of vegetables, and may have been associated with the decaying vegetable matter.

The species is dedicated to Mr. Alvah Peterson, who captured the first specimen.

PROCEEDINGS OF THE BROOKLYN ENTOMOLOGICAL SOCIETY.

Meeting of April 15, 1915:—Fourteen members present. Mr. Herman Greenwald was elected to membership. Long Island records: *Tricrania sanguinipennis* Say, reported by Mr. Dow from Central Park; *Tæniocampa rubescens, T. alia, Xylina unimoda, X. antennata, X. bethunei, Calocampa cineritia, C. curvimacula, Jodia rufago, Scopelosoma sidus, S. tristigmata,* all reported from the island by Mr. Engelhardt; Mr. McElvaire reported *Oncognemis riparis* at Northport. Mr. Olsen recorded *Idiocerus skurra* at Huntington, and also *Bruchomorpha oculata.*

Scientific programme: The Medico-Entomology of Pliny, by Mr. R. P. Dow. Mr. E. Shoemaker showed a collection of Long Island insects, including new records—*Renia tilosalis* Smith, *Antiblemma inexacta* Walker, *Aulonium parallelopipedum* Say, *A. tuberculatum* Leconte, *Soronia ulkei* Leconte, *Lymexyon sericeum* Harris, *Elasmocerus terminatus* Say, from Rockaway and Malaga, *Trogosita virescens* from Rockaway Beach.

Meeting of May 13:—Eleven members and four visitors present.

Long Island records: *Cephidia textrionis,* Wyandanch, by Mr. Engelhardt; *Epinaptera americana,* by Mr. Doll; *Anthocharis genutia,* Forest Park, by Mr. Megner; *Carabus nemoralis,* the European form, was reported by Mr. Davis from Staten Island, May 10, who also stated that it had been reported from Newark, N. J., Bronx, N. Y., and Brooklyn; Mr. F. M. Schott was reported to have taken it about White Plains, New York.

Programme: Mr. Olsen, "The Jassids of Long Island," to be published later in this Bulletin. Mr. Dow concluded "The Medico-Entomology of Pliny." Mr. Bueno exhibited a box of Heteroptera from British India, and directed attention to their very marked and characteristic facies.

Meeting of June 10:—Thirteen members and one visitor present.

Long Island records: Mr. Olsen reported *Carabus nemoralis* from Maspeth; Mr. Pasch, *Copris carolina* from Brooklyn; Mr. Doll reported a hermaphroditic *Callosamia promethea,* with upper side of right wing with male markings and lower side female, taken at Flushing; *Vanessa milberti,* from Wyandanch; Mr. Weeks reported *Arctia nais* from Patchogue; Mr. Doll also reported *Psaphidia thaxterianus* Grote, from Wyandanch; Mr. Engelhardt referred to the tent caterpillars, *Malacosoma americana* and *Malacosoma disstria* and their exceeding destructiveness on the Island. On willow he had secured *Homoglaea hircina* and on the bloom *Pachnobia salicarum, Eucetia pudens* and *Catocala elonympha* were also secured on April at Merrick, L. I., where *Tortricida testacea, Xanthoptera semiflava* and *Dysterias abortivalia* were also taken.

Mr. Bueno showed a larva of *Tenebriodes mauretanica* which had been found in a sealed package of epsom salt early in May. (N. B.—This lived till late July without any food.)

Programme: Mr. Dow spoke on Mr. J. Turner Brakeley and his wonderful place at Lahaway, N. J.

Meeting of October 14:—Seventeen members present and one visitor, Mr. H. H. Knight, of Cornell, a specialist on Miridæ.

The programme was the usual informal report by members on the collecting season. Mr. Franck reported catching *Hepialus auratus* in Sullivan County, New York; Mr. Bueno recorded the interesting Tingid, *Gargaphia angulata,* from White Plains, first record for the state; Mr. Nicolay reported the olive-green form of *Cicindela sexguttata* from Henryville and *C. patruela* abundant at Mt. Pocono; along the Potomac he had caught *Cychrus stenostomus, elevatus* and *shoemakeri;* on the top of Storm King Mountain, New York, he had found *Cicindela purpurea.*

Mr. Shoemaker reported taking ten *Cychrus canadensis* near Winnesaukee Lake, Ulster Co., N. Y.

Mr. Schott recorded *Calosoma sycophanta* in Flatbush and on Fire Island Beach; *Cicindela consentanea* from Wyandanch, April, and *Cingelia catenaria* very abundant in Babylon on October 3. Mr. Doll reported larvæ of *Papaipema speciossisima* on golden rod.

Mr. Engelhardt reported swarms of *Anax junius* in a clearing in a wood near Tangiers, L. I.; from Yaphank, *Cychrus elevatus,* in an old and abandoned cistern, and *Myas cyanescens.*

Mr. Dow reported *Catocala relicta* from Flatbush and *Arctia caia* from Sullivan Co.

Mr. Olsen reported a catch of forty or fifty specimens of *Pithanus mœrkeli* from Maspeth, a Palæarctic species heretofore unknown from North America. Mr. Bueno reported this also for White Plains. Mr. Olsen also recorded the Aphid *Calypterus betulæ* from *Betula populifolia.*

Mr. Davis showed the Mirid *Lygidea mendax,* from Yaphank, L. I., taken on July 26, 1908, first record from the island.

November 11 meeting:—Fourteen members and one visitors present.

Mr. Weeks exhibited a live *Pasimachus depressus* from Yaphank; Mr. Davis showed the gall of *Callirhytis cornigera,* usually to be found on *Quercus palustris,* but this on *Q. coccinea,* from Massapequa, L. I., July 11.

Programme: Mr. Bueno's paper on the Hemiptera Heteroptera of Yaphank was read in his absence, with exhibition of the rarer species therefrom, to be published later in the BULLETIN. Mr. Dow showed a large number of plaster casts of insect burrows, by the late Mr. Brakeley, the originator of the method.

December meeting:—Present twelve members and two visitors. Mr. Howard L. Clark, of Providence, and Mr. Howard Notman, of Brooklyn, were elected to membership.

Long Island records: Mr. Schott reported from Little Neck, L. I., *Cychrus elevatus* on December 11, and also *Carabus vinctus* and *C. limbatus.*

Programme: Mr. G. P. Engelhardt, on "The Sesidæ of Long Island," which will be published later. Mr. Bueno presented a paper on "Westchester Miridæ—A First Notice," which will appear later in the BULLETIN.

Report of the Secretary of the BROOKLYN ENTOMOLOGICAL SOCIETY for 1915: In the year just past, the Brooklyn Entomological Society has pursued the even tenor of its way. No events of the first magnitude have disturbed its steady progress. Perhaps the most worthy of its achievements is the continued support given to its BULLETIN, which, rejuvenated under the guiding and fostering hand of its editor, is worthily continuing the tradition of its predecessors, maintaining a high standard and striving for an ever higher, on a practically self-supporting basis. The scientific papers have ranged "from China to Peru," all phases of our favorite science have been touched upon and hitherto unknown facts have been illuminatingly presented to us. The titles have ranged from "The Sacred Scarab Beetle," type of the self-existing Egyptian Sun-God, to "Mosquito Destruction in the Suburbs of Brooklyn," five thousand years apart in time and 10,000 miles in space. No less than fourteen papers of quality were presented in eight meetings. Under Long Island records 86 species have been reported as occurring on the island, not heretofore noted, contributed by Messrs. Davis, Nicolay, Shoemaker, Engelhardt, Franck, Dow, Weeks, Olsen, Doll, Pasch and Bueno.

Attendance at meetings ranged from 11, in May, to 17 in February and October, with an average of 14 plus. The most constant attendants, present at every meeting as beseems officers, were Messrs. Olsen, Dow, Bather. Twenty-six members attended one or more meetings, and there were also thirteen visitors. Two members resigned in the year, Messrs. Pearsall and Levinson; and three were elected.

On the whole, the Society may be said to have prospered in the year past. It is undiminished in numbers, and while the insect frontiers recede further away from the city day by day, the "Old Guard dies but never surrenders," and keeps its spirit young while it lives; when it falls the younger generation steps in full of vim and enthusiasm to carry on the work one step further till they too shall merge into the cosmos, their material forms dissolved into the elements that compose them; their ego persisting in their worthy work; and their souls returning to the Infinite, whence they came to do their share in the progress of the race of man.

The Brooklyn Entomological Society shall go on through the impulse of these labors, to continue by its activities that tradition handed down from John B. Smith and his fellow worthies, which constitutes their precious legacy to us. J. R. DE LA'TORRE-BUENO,

Secretary.

NOTE ON PSENOCERUS SUPERNOTATUS.

By R. P. Dow, Brooklyn, N. Y.

In January I inspected a number of twigs of sumac, two species, *Rhus copalina* and *R. glabra,* hoping to find evidences of *Nemosoma cylindricum.* The live twigs contained nothing, the dead ones were thickly populated with very small Scolytid larvæ and some species of Cerambycid, the almost full grown larvæ boring the pith chamber lengthwise.

A bundle of twigs put in a cloth covered jar yielded imagos in April. The longhorn proved to be *Psenocerus supernotatus.* This seems to be a new food plant record. The New Jersey list gives currant, but others are known.

The first arrivals were two males, one about twice as big as the other. On the first day both were observed to find an attraction in a particular spot on one of the twigs. They met and fought. The smaller had his left antenna bitten off above the third joint. Two days later I inspected the jar at daybreak. The "woman in the case" had arrived, making her entrance on the very spot where the fight had occurred and had already gone to housekeeping, but with the cripple as her partner. The victor was not seen to come near them. It is evident that some sense organ revealed the female to the males not less than 36 hours before her emergence from the unbroken wood.

Two weeks later a number of *Liodes alpha* emerged from the twigs. This was the species to be expected from this food plant.

THE DANCE OF THE GHOST MOTH.

Mr. E. D. Keith, of Providence, R. I., writes of his 1915 experiences: "I see great differences in collecting conditions since I began in 1900. The past five years especially have brought many changes, making our collecting places few and far between. I have not made many rare captures this year, though some seem worthy of mention. *Glœa carnosa* came to light; *Panchrysia purpurigera* was bred from meadow rue; *Autographa biloba, Oxygramma rogationis, Hadena burgessi, Agrotis violaris, Homoptera cingulifera, Xylina disposita,* and *X. fagina* were captured. Many desirable species are growing scarcer from year to year. The only Sphingidæ that can be called common are *Smerinthus geminatus, Protoparce sexta* and *P. carolina*. It is the same with many Bombycidæ and Noctuidæ. My series of *Sthenopis 4-maculatus* came from a swamp which is fast being converted into a dump heap, with ashes, tin cans, and other refuse of a city. This little swamp, at one time filled with Viburnums, Vacciniums, Clethra, Alders, Jack-in-the-Pulpits, and other swamp livers, is the home of the Ghost Moth (*Hepialus argenteomaculatus*). In early June I start out at twilight, as the robin is singing his evening song. A catbird gives his scolding cry and flits into the bushes. The Maryland yellowthroat says "wait a bit," then becomes silent. Dusk is approaching. Many Geometridæ fly over the shrubbery; *Diacrisia virginica* and *latipennis* are common.

"It is about quarter to eight when I select an opening among the bushes to watch the so-called dance of the males of the Ghost Moth. Each male will give quite a swing like a pendulum, often with an arc of four feet or so. Their flights do not last longer than fifteen or twenty minutes. Sometimes they go away quite a distance, dance, and come back to their former places. I have seen the females come to the males but never found them mated. I have read that the females fly over the herbage, scattering their eggs as they go,—haphazard. I have observed them more than once on alders, crawling with fluttering wings up the main trunks as if they were ovipositing, but I have never found the pova, which are very small. The adult life of this species seems to be fifteen days. I only took a pair this year, though I saw quite a few. It is a greater pleasure to observe the habits of a species than to collect and I dislike to clean out a place.

" There is never a year that the woods are not set on fire, and this is no exception. Collecting at willows is out of the question as the ' kids ' break down and destroy every pussy willow around here. All this is the case around Providence. A dozen miles or more away conditions would probably be different."

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Vol. XI APRIL, 1916 No. 2

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OF THE

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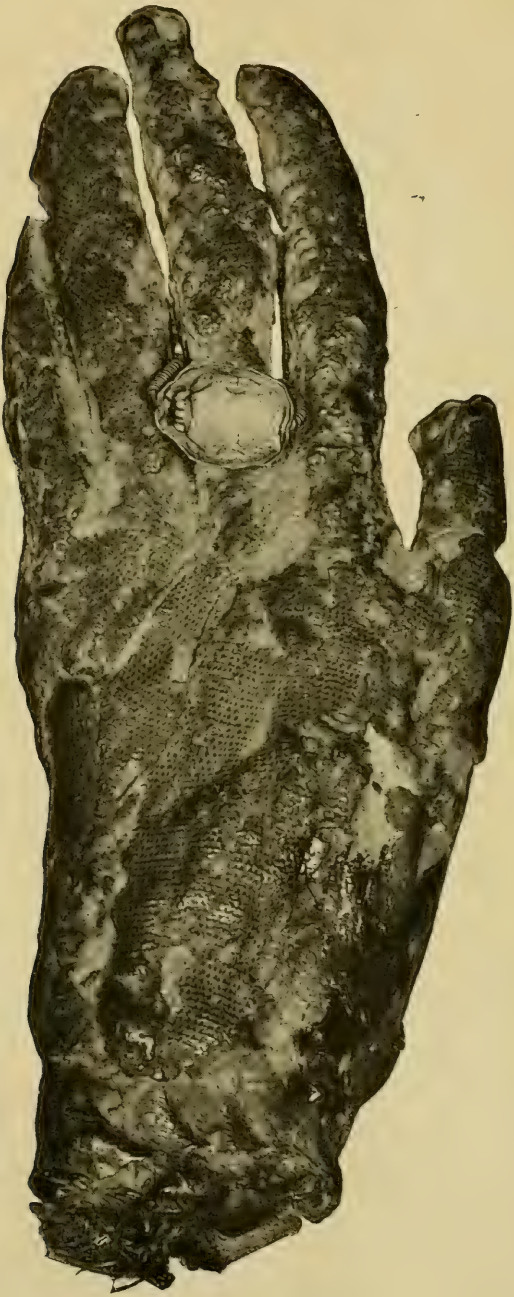

THE HAND OF THE PRINCESS — DOW

BULLETIN
OF THE
BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XI April, 1916 No. 2

THE TESTIMONY OF THE TOMBS.

By R. P. Dow, Brooklyn, N. Y.

In Egypt the surviving arts show that at the earliest known periods there was the greatest degree of initiative, the widest latitude of expression, the finest workmanship. Nevertheless surviving records of all Egypt do not mention the economic aspect of insects as extensively as the single chapter of Exodus regarding the plagues sent to rebuke a faithless Pharaoh. No chronology can bring nearer than, say, 6,000 B. C. the date of the first king of the reputed first human dynasty, Menes, a physician, learned in anatomy, and it is probably earlier than 9,000 B. C. That the land was densely populated is proven by the great numbers of men needed to build the great pyramids of about 4,000 B. C. The remains of aboriginal culture are few, since agricultural Egypt was always the favorite conquest of the warlike and less civilized. The papyri date only from about 1,500 B. C. The monuments in stone are the material for all that we know. From them the corps of savants of Napoleon drew the information that made Egypt known to the world. The best scholars of the time, 1797, searched every discoverable record. The insect data were handed to Lat-

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The frontispiece represents the hand of a princess of a dynasty living about 1,800–2,000 B. C. It is almost exactly life size. In 1868 a series of royal tombs were discovered near Memphis. The severed hand, which is clearly that of a young woman, was secured by Rev. Howard Crosby and is now owned by Nicholas E. Crosby, Ph.D., of New York. The rest of the mummy is in Cambridge, Mass. The texture of the cloth surrounding the hand is clearly to be seen. The stone of the scarab itself is pale green. The ring is of gold, a plain wire, wound on the upper half with finer wire.

reille to be worked up, but they were pitiably meager. However Egypt gives us the first mention of a beetle, the scarab. The worship of this creature antedates the history of any land.

In life the scarab is a coprophagous Scarabæid beetle, about an inch long, black and stout, occurring commonly all around the Mediterranean, extending to the Cape of Good Hope and to south China. Its life history is similar to that of any of our common *Canthon* or *Copris*. Its scientific name is *Ateuchus sacer*. No severer arraignment can be made of the vandalism injected into scientific nomenclature than the mutation whereby the generic name *Ateuchus* has been substituted for *Scarabæus* in violation of every phase of the rights of priority and the destruction of the right application of name to the oldest, grandest, best known genus of beetles in the world. Throughout classic times and the Middle Ages all beetles were known either as *Scarabæus* or *Cantharis*. The type of the genus restricted by Linnæus is, of course, the sacred beetle.

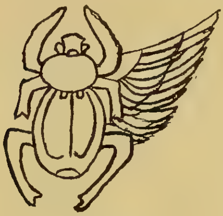

FIG. 1.

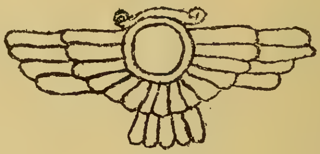

FIG. 2.

FIG. 1 is drawn from a gold inlay on a lacquered copper box. While it came from Assyrian remains near Ninevah and dates about 800 B. C., it is characteristically Egyptian and was probably imported. One wing is omitted for convenience. Note that the wing is feathered like a bird, not membranous like a beetle. This conventionality is general after, say, 4,000 B. C.

FIG. 2 is a conventional symbol of very common occurrence, meaning the flight of time or the complete cycle of the world. Egyptologists generally call it a bird symbol. Compare it with Fig. 1, and note that, while the tail is of a bird, the horns are of the scarab. The wings might be either. The significance of the symbol is that of the scarab.

The present genus *Ateuchus* is a fairly large one, about thirty species being so far described from Africa. More than one were included in Egyptian veneration. A notable variety, found widely in Egypt and Nubia, named by Latreille *Ateuchus Ægyptorum*, is golden green, larger than the true *sacer*, and Pliny says that to gaze upon it relieves the eyes of fatigue. Another species mentioned in ancient times, but not now clearly identified is smaller and with small horns turned backward. This creature preserved life if picked up by the left hand and worn as an amulet. Still another is called *Fullo*, is covered with white spots, and made a precious amulet. No *Ateuchus* corresponds to this description but it has been discovered recently that beetles of other families were considered also as scarabs, notably those of the genus *Pimelia*. There is a species of this genus, quite as robust as an *Ateuchus*, which is thoroughly specked with white. Moreover, the beetle shown in figure 1 is undoubtedly a *Pimelia*, although regarded by the Egyptians themselves as a scarab. The three elytral marks are a faithful copy of a species still common in Africa. Further evidence is the pygidium shown in the drawing. This is a constant character in *Pimelia*, but never found in the coprophagous Scarabaeids.

In the American Museum of Natural History there are several fine necklaces brought from the Congo region by the Lang and Chapin expedition, which clear up the matter. They are of *Pimelia* beetles which the natives strung after having *embalmed* them. The process of filling the bodies with gums and spices is remarkably like the ancient Egyptian embalming process, so much so that it is almost certain that it is a survival of the same custom and further proof of the kinship of the aboriginal Egyptians with the black races throughout the whole length of Africa.

The beetle shown in figure 3 is obviously a true Scarabaeid, but figure 4, while a scarab in religious intent, reminds one strongly of a *Cetonia*.

When the annual subsidence of the overflow of the Nile leaves throughout the valley its fertile coating of rich mud, the scarab is the first notable creature emerging. It heralds the beginning of spring, the return of nature's creative power. Its stay is brief. Writers of the last century B. C. assert that the odor of roses is fatal to it. In reality the scarab disappears for the season about the time the roses blossom. Promptly after emergence from the mud the scarab takes some cattle dung, shapes it into a sphere, like the world, rolls it from east to west with its hind legs, itself looking toward the sunrise while rolling its burden along the course of the sun. The dung ball (having within it an egg laid by the female) is buried in a hole dug by the fore tibiæ, the fore tarsi being obsolete in these beetles. It remains in the hole for twenty-eight days—the lunar month. The creature within, then animated, opens the ball and on the 29th day casts it into the water, for on this day conjunction of sun and moon takes place, of which the generation of the world was the first result. The dentation of the fore tibiæ of the scarab are 30 in number,—the days of the celestial month, and those on the head resemble the sun's rays. Hence its dedication to Amen-Ra, the Egyptian God of the Sun Mystery.

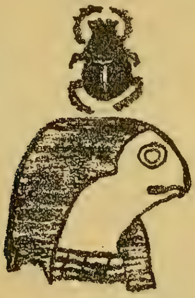

FIG. 3.

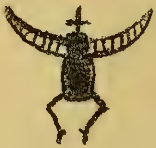

FIG. 4.

FIG. 3 is the common type of sculpture of Ka, the Father of all the Gods, known to the Greeks as Batrachacephalus, *i. e.*, with the head of a frog. Note that the scarab is drawn naturally, not conventionalized. This, then, is early art. Inferentially the Father of the Gods is the one worshipped earliest.

FIG. 4 is a much conventionalized scarab from a signet ring of some non-royal person. It is barely possible that the distortion of head is a relic of the oriental phallic worship.

The oldest extant written reference to the scarab is that of Horapollo, an Egyptian, who explains that the word means *only begotten*. It designates also generation or a father or the world or a man. The Egyptians claimed that the beetles generated without the meeting of the sexes, which would at first seem a remarkable superstition. In fact, however, the copulatory act is performed in great secrecy and is not easily observable.

If the worship of the scarab began in Egypt it was by a race long since disappeared. Isaac Myer, whose monograph* is admirable, believes it antedated Menes, the first king, and was prevalent among the aboriginal people of the land. The Hottentots of south Africa still hold the insect in religious veneration, from which fact it might be argued that a black race were the Egyptian aborigines and when driven out or made subject by later races left behind religion and language. It is true that the Hottentot language is closely related to the ancient Egyptian. It is possibly a coincidence and possibly an offshoot of the same origin that the natives of Madagascar worship a holy cricket, especially as a similar word designates both creatures.

That the scarab is not found mummified is probably due to the fact that it dries without mummification, retaining its form. The cat and the bull, both devoted to sun worship, required artificial preservation. The cat expands and contracts the pupil of its eyes according to the hour of the day—the position of the sun. Horapollo says that one kind of scarab is like a cat, and irradiated

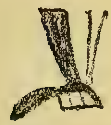

FIG. 5.

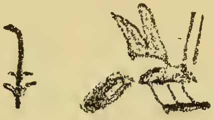

FIG. 6.

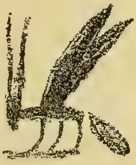

FIG. 7.

FIG. 5 is from the cartouche (i. e., the signet, equivalent to our signature) of Shufu I, the builder of the Great Pyramid, about 4,000 B. C. The Egyptian hieroglyphics are a series of pictures, each representing a phonetic sound, a letter, as well as a symbolic significance. The wasp signified the power of inflicting the punishment of death. Hence it is a royal token.

FIG. 6 is similar and comes from the cartouche of the son or brother of Shufu, who succeeded him. Note the different shape of wings. The figure to the left is a conventionalized scorpion.

FIG. 7 is from the cartouche of Psammetichus I, the scholar Pharaoh of Egypt. Note the different shape of wing, head and antenna. This is about 3,000 years later than the two preceding. This same letter occurs in the cartouches of all the members of his family.

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* "The Scarab," Isaac Myer, N. Y., 1894.

(whatever that may be), hence it is the Sun God's own, hence the statue of the God in Heliopolis, the City of the Sun, in the shape of a cat. Horapollo says that another kind of scarab is bull-formed and two horned. The *apis,* or sacred bull, was greatly revered. There was only one at a time and a wonderful underground city at Memphis is devoted to their mummies. Both bull and bull scarab typify the two horns of the new moon. A third scarab, says Horapollo, has but one horn. It suggests the sacred long billed ibis, equally venerated and mummified after death.

Manetho, an Egyptian historian and philosopher wrote much about the scarabs and their significance, but his works are lost, except the liberal extracts made by Pliny, the Roman naturalist.

Representations of the scarab were made in all possible ways. It was customary to carve the back like the creature itself but to omit the legs, leaving the undersurface flat so that it might be engraved with signature, motto or religious text. Many were drilled from end to end and strung as beads. They were set as brooches or rings. Others were mounted as signets. People of wealth had them carved from stone, and no stone was of too great value for this use. The common people used them of baked and vitrified clay. Much can be told of the age of a genuine scarab from its constituent material. Unfortunately few of them now sold to tourists are genuine. The natives have become adept in their manufacture and plant them in convenient places, waiting for the gullible tourist to come along and make what seems to him a precious find. And yet millions and millions of them were buried with the dead for thousands of years. They are of all sizes. One is five feet long, carved from fine stone. Most of them are rather smaller than the real insect. The earliest positively known belonged to Nebka, a king of the third dynasty, somewhere between 3,900 and 7,000 B. C.

The worship of the scarab never got foothold in Greece. The two religions differed too widely, one being entirely personal in conception of the Deities, the other based on unequalled knowledge of astronomical mysteries. It is alluded to ironically by Aristophanes, the word for its description being always *Heliocantharis*—the sun beetle. It was never connected with *karabos* the Greek word for the horned beetles. The root of this word is old. Its Sanscrit form is *carabha,* and was applied to a locust, also to the spiny lobster. The Greek *karabos* is also supplied to the spiny lobster. It is curious that the Latin word *locusta* means not only grasshopper or locust but means spiny lobster, as well. The word *Carabus,* as we use it, was taken directly from the Greek. One well-known Greek manuscript spells the word *skarabos,* but this is probably the error of a copyist. The word *scarabæus* is Latin, taken direct from Egypt as closely as the sound could be imitated.

One might suppose that the scarab worship would be carried to Rome during the period of widest religious latitude following the reign of the Emperor Heliogabalus, himself an Asiatic priest of the Sun God, but there is no evidence to support this view. The world-wide distribution of the scarab was carried on by the Phœnicians, that astute people who migrated overland from the Red Sea coast to the coast of Palestine and founded the rich cities of Tyre and Sidon long before the Trojan war, before 1,100 B. C. This people monopolized the world's commerce as traders and slave dealers. Egypt was both largest customer and source of supplies. The Phoenicians learned to manufacture scarab signets in wholesale fashion and market them all over the world.

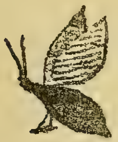


Fig. 8.

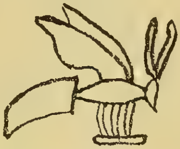


Fig. 9.

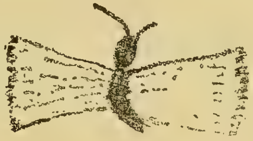


Fig. 10.

Fig. 8 is drawn from the cartouche of Rameses III. It is the same as that of Rameses II, always remembered as the oppressor of the Israelites. Note the different shape of wing and the general aspect, hardly at all like a wasp. Yet the symbol is undoubtedly the same. Rameses II was a great king and great general. Other history does not give him the bad character which Exodus does.

Fig. 9 is from a rock carving of Menephtah. It is in even relief, hence the outlines. Note the squared front to the abdomen.

Fig. 10 is probably the earliest picture in the world of a butterfly. It is part of an elaborate carving on a rock tomb near Thebes. For whole picture compare the text.

Only the scarabs now dug up tell the world of Phœnicia, of whose cities, like Carthage, its colony, not one reminiscent stone remains on another. Possibly the Phœnicians reached the Hottentots. They certainly introduced the scarab to the Etruscans, who were the most powerful people of Italy before the rise of the Romans. Scarab effigies are still numerous in Etruria. They ceased to be made when Etruscan industry was carried to Rome. They came afresh from Egypt three centuries after the Christian Era and became adopted as a Christian symbol. St. Ambrose, the famous Archbishop of Milan, the converter of St. Augustine, wrote of "Jesus, the good Scarabæus, who rolled up before him the hitherto unshapen mud of our bodies." The symbol survives. The scarab is carved now on many an Italian tomb.

From the rock tombs come the best pictures of all Egypt. Only one other beetle is drawn, a cetonian eating a leaf. There are a number of the honey bee, which was plentifully kept in the Nile valley. There is one graphic picture of a *Sphex* preying on a spider. Wasps of the *Vespa* group, as well as *Sphex,* are very common, but they are conventionalized. Four of them are shown here, explained in the footnotes. In the paper, "The Earliest Insects in the World," there is an explanation of the origin of the wasps, and their power of inflicting death. There is a close relationship between Persia and Egypt, dating prior to 6,000 B. C.

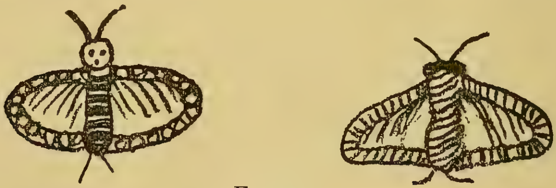


FIG. 11.

FIG. 11 shows two of the three butterflies from a wonderful drawing on a rock tomb at Benihassan. The whole picture is of a papyrus thicket. In the water is a sturgeon-like fish and a sea cow. In the grass are five bird's nests, with eggs and young. An ichneumon is shown hunting for eggs. Above are seven species of birds, alight, on the nest or in flight. While the butterflies are of the same species, they differ in body marking and shape of wing. Note especially that the artist was not an entomologist. His butterflies have caudal appendages.

From the tombs of Egypt the housefly is pictured, not unplentifully. A gadfly is drawn chasing a cow. Grasshoppers are often drawn, but in no instance as well as some from Chaldæa. Of the butterflies, the two best are given in our cuts. The earliest in the world is shown in Fig. 10. It dates from about 1,700 B. C. The whole picture is on a tomb near Thebes. It is a fine relief carving. A nobleman is seated in a wicker chair, fishing in the Nile. Above his head is flying a butterfly. The artist was not familiar with the four-wingedness of his model.

From the unwrapping of human mummies many insects have come to light, some probably accidental introductions, a few separately and carefully wrapped. *Necrobia rufipes* might have been an accident. So probably was a specimen of *Lucilia cæsar,* a cosmopolitan flesh fly. A Buprestid and a Cantharid beetle were clearly intentionally preserved.

The mosquito is neither pictured nor alluded to. It was left to Herodotus to mention that creature in his Egyptian narrative, although it is not differentiated from pestiferous biting insects generally. He relates that they were so numerous near the mouth of the Nile that the fisherman used nets to fish by day and escape the mosquitos by night.

NEW NORTH AMERICAN SPECIES OF NOTOXUS.

By H. C. Fall, Pasadena, Cal.

A recent survey of the material in my cabinet in this genus revealed the presence of a number of new species, which are herewith described. It is a notable fact that in two of the new forms and also in *montanus* Csy.—which was described from a unique female—the anterior tibiæ are found to be toothed in the male, a character hitherto known only in *calcaratus.*

Notoxus Geoff.

Notoxus nuperoides n. sp. Form and size of *nuperus,* with which also it agrees precisely in elytral markings. Head and thorax rufotestaceous, the latter broadly suffused with blackish on the disk, except for a narrow median line; elytra rufotestaceous, with the sides, apex and a post-median fascia which extends forward along the suture becoming broader at base, black; or the elytra may be defined as black, each with a somewhat oblique gradually widening stripe extending from the humerus to the middle, and a subapical lunate spot, rufotestaceous. Recumbent pubescence rather dense, and bristling throughout—more especially on the elytra—with numerous long semi-erect hairs; punctuation fine, somewhat closer and more distinct on the elytra than elsewhere. Head and antennæ nearly as in *nuperus,* the tempora, however, a little less strongly oblique than in the latter. Pronotal horn two fifths as wide as the prothorax, distinctly margined, the margin dentellate at sides posteriorly; crest with feebly reflexed non-dentellate margin. Sutural angles of the elytra (♂) separately rounded and just perceptibly produced, with a feeble external sinuation. Body beneath darker rufous, the abdomen piceous, the last segment somewhat paler.

Length 4 mm.; width 1.2 mm.

The unique type is a male, having the last ventral segment squarely truncate at apex and broadly transversely impressed throughout its width; it was taken at Silver City, New Mexico, by Mr. J. B. Wallis, from whom I received it.

As already observed, this species is nearly identical with *nuperus* in elytral markings and by Casey's table would be associated with it. The latter species however entirely lacks the erect hairs of the upper surface, and the form of the elytral apices, and the impression of the last ventral in the male are different.

Notoxus brevicornis n. sp. Rufous, head, prothorax above (except the horn) and abdomen more or less suffused with piceous; elytra black with two paler fasciæ, one before the middle, narrowest at suture, gradually widened, and produced anteriorly at sides so as to include the humeri; the other behind the middle, narrower, biarcuate. Pubescence moderately dense, intermixed on the elytra with short semi-erect hairs which are not very conspicuous except in profile; punctuation moderate, integuments somewhat shining. Antennæ about as long as the head and prothorax, very feebly incrassate apically, the tenth joint scarcely longer than wide. Eyes rather small but evidently longer than the tempora. Prothorax about as long as wide; horn rather stout, not constricted at base, fully one half longer than wide, more than one third the width of the prothorax, margin not dentellate, crest well developed, with nondentellate margin. Elytra four fifths longer than wide, obviously widened postmedially, apex obtusely rounded, the sutural notch very narrow, the angles only slightly rounded. Body beneath and legs as usual, the last ventral (♀) with the tip rounded.

Length 3 mm.; width 1 mm.

Santa Rita Mts., Arizona. A single specimen submitted by the late Prof. Snow.

By Casey's table this species would be associated with *montanus* and *balteatus*. From the latter it may at once be distinguished by the presence of the intermixed erect hairs of the elytra, and from the former by the unmodified elytral apices in the female.

Notoxus breviusculus n. sp. Size small, form rather stout, especially in the female; dusky testaceous, elytra with a more or less bilunate black fascia at, or a little behind, the apical third, each with a scutellar spot and an antemedian lateral spot, both rather small, and in the darker specimens rather indistinctly outlined or even diffusely connected. Surface distinctly shining; vestiture rather fine; abundantly intermixed with moderately long suberect hairs. Antennæ scarcely longer than the head and prothorax, distinctly though not strongly incrassate apically, the tenth joint not, or but slightly, longer than wide. Head and prothorax sparsely very finely punctate; eyes rather small, subequal in length to the tempora. Horn narrow, feebly constricted basally, at its widest part scarcely one fourth the width of the prothorax, its margin moderately reflexed, even; crest well defined, nondentellate. Prothorax transversely globose. Elytra three-fourths longer than wide, becoming gradually widest behind the middle, more noticeably so in the female; apices in the male separately obliquely truncate, the external angle subdentiform; in the female broadly conjointly subtruncate, the sutural angles nearly rectangular. Body beneath varying in color from testaceous to piceous, finely punctate and pubescent as usual. Last ventral of the male narrowly truncate at tip, and with a rounded or subtransverse impression before the apex; in the female with the tip subangulate and not impressed.

Length 2.3–2.8 mm.; width .85–1 mm.

California, Plumas Co. and Eldorado Co. (Nunenmacher); Tallac (Fenyes). The type is a male from Plumas Co.

This species may be placed near *nevadensis* in Casey's table, some examples of which it closely agrees with in its elytral markings. It is a smaller species than *nevadensis*, with relatively shorter elytra, and with much narrower non-dentellate pronotal horn.

Notoxus pallidus n. sp. Elongate, testaceous, elytra each with a small suboval discal fuscous spot at about the apical two fifths. Pubescence abundantly intermixed with long erect hairs; integuments finely evenly not densely punctate, moderately shining. Antennæ about half as long as the body, feebly incrassate, the tenth joint nearly one half longer than wide. Eyes rather large, distinctly longer than the tempora. Prothorax subglobular, the horn (♂) less than one third the thoracic width, about twice as long as wide, not constricted at base, narrowed from apical third, the apex narrowly rounded, margin with one or two denticles posteriorly; crest well developed, margin not dentellate. Elytra elongate, parallel, slightly more than twice as long as wide, apices (♂) not prolonged or truncate, sutural angles rounded. Body beneath as usual; last ventral segment (♂) broadly transversely impressed toward the apex, the margin feebly truncate.

Length 3.7–3.9 mm.; width 1.2–1.25 mm.

Described from two male specimens taken at Yuma, Arizona, by Dr. Fenyes.

This species by the above characters is separable easily from all previously described forms. It would by Casey's table fall near *cavicornis*. Its true relationship may be more definitely determined when the female becomes known.

Notoxus arizonensis n. sp. Form rather slender, rufotestaceous, feebly shining, elytra with rather narrow more or less bilunate subapical and median transverse blackish or dusky fasciæ, and with a subsutural dusky spot at base, all subject to some variation in development, the basal spot becoming subobsolete in the less distinctly marked specimens. Vestiture cinereous, short, fine, moderately close, recumbent, intermixed on the elytra with sparse short semierect hairs, which are quite inconspicuous. Antennæ longer than the head and prothorax, scarcely thickened apically, the tenth joint one third longer than wide. Prothorax slightly wider than the head, finely punctate with a tendency toward strigosity at sides anteriorly; horn well developed, one third to two fifths as wide as the prothorax in the male, obviously wider on the female, margins moderately reflexed, especially at apex, but not dentellate; crest feebly margined, not dentellate. Elytra about two thirds wider than the prothorax, twice as long as wide or slightly more, slightly or scarcely inflated posteriorly, punctuation fine but moderately close, apices rather broadly conjointly rounded as viewed from above, with a minute sutural notch, similar in the sexes. Body beneath finely punctate and pubescent. In the male the last ventral segment is scarcely longer than the preceding, the apex distinctly truncate, the truncation just perceptibly anteriorly arcuate, with its limits broadly subangulate. In the female the last ventral is as a rule nearly twice as long as the preceding, the apex rounded.

Length 3.3–4 mm.; width 1.1–1.25 mm. Southern Arizona.

The type is a male from the Chiricahua Mts., taken by Mr. V. L. Clemence, July 9. Other examples are from the Huachuca Mts., July (Clemence), and from Nogales, August (Nunenmacher). The species in its elytral markings is almost an exact reproduction of *delicatus* Csy., in the latter however the erect hairs of the upper surface are more marked, the thoracic horn distinctly dentellate, the crest obsolete, and the sexual characters at the ventral apex different. *Arizonensis* should follow *delicatus* in the table given by Casey.

Notoxus montanus Csy. This species, which was described from a unique female specimen from Colorado, is rather widely distributed in the southern Rocky Mountain region. Specimens are known to me from Colorado—Florissant, Aug. 6 (Rohwer); New Mexico—Santa Fé, July (Fenyes); Pecos—June (Cockerell); Arizona—Chiricahua and Huachuca Mountains (Clemence); Flagstaff (Fenyes); and Williams (collected by the writer).

In the male the front tibiæ are toothed internally as in *calcaratus,* the last ventral segment is truncate, the truncation feebly arcuate-emarginate; sutural angles of elytra rounded in some examples, seemingly very faintly produced in others.

The identity of this species has been established by Col. Casey, who has kindly compared Chiricahua examples with his type.

Notoxus similis n. sp. Moderately elongate, shining, recumbent pubescence intermixed with numerous semierect setæ of moderate length. Head and prothorax rufous to rufopiceous, the horn paler; elytra rufotestaceous, with a basal spot each side of the suture narrowly connected with a smaller lateral spot (sometimes absent), a more or less biarcuate median fascia, and the apex black; the tips becoming indefinitely paler, chiefly from transmitted light. Antennæ, legs and body beneath rufotestaceous, the abdomen piceous. Antennæ nearly half as long as the body, very feebly incrassate apically, the tenth joint about one half longer than wide. Head smaller than the prothorax, distinctly, not very sparsely punctate, tempora oblique, broadly arcuate, nearly as long as the eyes. Prothorax as long as wide, moderately closely punctate; horn (♂) rather stout, crest well developed, reflexed margins not dentellate; in the ♀ distinctly broader and a little constricted basally. Elytra varying from slightly less to slightly more than twice as long as wide, feebly inflated at middle, subbasal transverse impression distinct, apices slightly prominent, the sutural angles feebly sinuately produced in both sexes. Body beneath finely punctate and pubescent as usual. Last ventral of male distinctly arcuately emarginate at apex, front tibiæ toothed at the middle of the inner side.

Length 3.3–3.6 mm.; width 1.1–1.35 mm.

The type is a male from Glenwood Springs, Colorado. Other examples are from Antonito, Colorado, and Santa Fé, New Mexico—all collected by Dr. Fenyes.

This species is in all essentials very similar to *montanus* Csy., and females of the two cannot always be determined with certainty. The dark markings are as a rule less developed at the elytral base in *similis,* and the punctuation of the head and thorax is typically stronger and closer, but these characters are both variable. The prothoracic horn is notably stouter in the male of *similis* than in the same sex of *montanus,* being scarcely more than one half longer than wide and more obviously wider than crest. In *montanus* the sexual disparity in the size of the horn is very great. The truncature of the last ventral segment (♂) is distinctly more strongly emarginate in *similis* than in *montanus.*

Although agreeing in the dentate male front tibiæ with *calcaratus,* both *montanus* and *similis* differ considerably from the latter in general habitus, and resemble rather *bifasciatus,* which of course is very distinct by its interrupted pale elytral fasciæ and the simple fore tibiæ in the male.

Notoxus intermedius n. sp. Moderately stout, testaceous; elytral markings, consisting of a small basal subsutural spot on each, a median transverse fascia and a small subapical one, black. Both the basal and subapical marks are, however, either entirely wanting or but faintly indicated in more than half the specimens seen. Decumbent pubescence not dense, intermixed with semierect hairs of moderate length; integuments shining, moderately closely finely punctate. Antennæ scarcely or feebly incrassate apically, the tenth joint scarcely one half longer than wide. Eyes a little longer than the tempora. Prothoracic horn (♂) moderately stout, fully one half longer than wide, not constricted at base, margin not dentellate except basally, broadly evenly rounded apically; crest well developed, margin not dentellate. In the female the horn is wider and constricted basally. Elytra twice as long as wide or very nearly so, feebly inflated postmedially, sutural angles rounded, not distinctly produced in the male, a little produced and with a slight external sinuation in the female. Beneath finely punctate and pubescent; legs moderate, the anterior tibiæ toothed at the middle of the inner margin in the male; last ventral not impressed, the apex distinctly emarginato-truncate in the male, subacute and narrowly rounded at apex in the female.

Length 3.2–4 mm.; width 1.1–1.35 mm.

Described from a series of thirteen specimens taken by Dr. Fenyes at Bishop and Olancha, Inyo, Co., California. The type is a male from Bishop.

This species, in its fully marked form, is closely similar to *calcaratus,* which differs in its much longer and more numerous elytral setæ, stouter prothoracic horn with distinctly dentellate side margins, sutural angles not produced in the female, and with the last ventral in the male impressed and feebly truncate, but not emarginate at apex. The sexual characters are nearly as in *montanus* and *similis,* especially the later, but the size and general appearance are nearly as in *calcaratus.*

A NEW TINGID FROM NEW YORK STATE.

By J. R. de la Torre Bueno, White Plains, N. Y.

Genus Acalypta Westwood 1840.

Orthosteira Fieber 1844. *Orthostira* Fieber 1861.

1. Pronotal keels subparallel or very slightly diverging posteriorly; costal area uniseriate in greater part; third joint of antennæ long, more than three times the fourth........................*Acalypta lillianis,* n. sp.
2. Pronotal keels diverging posteriorly; costal area biseriate in greater part; third joint of antennæ short, not quite twice as long as the fourth ....*A. thomsonii* Stål.

Acalypta lillianis n. sp. Black, posterior part of pronotum and hemelytra dark gray; third joint of antennæ of equal thickness throughout, four times as long as the fourth, longest, second joint shortest, first stoutest and shorter than fourth, which is not quite so stout as second; pronotum tricarinate, keels nearly parallel, or at most slightly diverging posteriorly, the middle keel highest; hood small, not projecting over head, slightly angulated in front, somewhat higher than the median keel; sides foliaceous, more or less biseriately reticulate, anteriorly rounded; costal membrane uniseriate in greater part. Abdominal segments broadly banded with rufous.

The macropterous form has the membrane complete, reticulately veined; in the brachypterous, it is much reduced and is biseriately reticulate. The pronotum in the former is quite high, but in the latter much reduced in area and nearly flat. The hemelytra are one third longer than the body in the macropterous form, and in the brachypterous exceeds it but very little. The brachypterous form is nearly oval, while the macropterous is elongate.

Macropterous, long 3 mm.; wide 1.6 mm. (type).
Brachypterous, long 2.3 mm.; wide 1.2 mm. (type).

Described from eight macropterous and nine brachypterous specimens. Type, macropterous, female, White Plains, N. Y., May 25, 1911. Type, brachypterous, male, White Plains, May 28, 1909. Paratypes, macropterous, all females, White Plains, N. Y., May 21, 29 and 30. The Forks, Me., June 16, 1900, O. O. Stover, collector; Scarsdale, N. Y., May 25, 1909; Marquette, Mich., July 14, John D. Sherman, Jr., collector. Paratypes, brachypterous, all males, White Plains, N. Y., May 18, 21, 23 and 28.

Types in my collection; paratypes in collection U. S. National Museum, H. M. Parshley and Otto Heidemann.

Of eleven other specimens from White Plains on various dates in May and one in June, all the macropterous are females and the brachypterous males.

This species was taken on a damp and marshy meadow, by sweeping close to the ground, in places where the tall tree-like moss grows in clumps. The European species of *Acalypta* are generally found in moss. It is not very common, and is taken in twos and threes, principally in May. I have taken nearly full-grown nymphs under stones March 5 and 19, April 2, November 25 and December 5, which would indicate that the species over-winters as nymph.

DISPERSAL OF SOME ORTALIDÆ.

By Frederick Knab, Bureau of Entomology, U. S. Department of Agriculture.

The Ortalidæ have recently received comprehensive treatment by Hendel, four numbers of Wytsman's "Genera Insectorum" dealing with as many of the seven subfamilies. From this work it is apparent that a large proportion of the genera are peculiar to one or the other hemisphere, or to still more circumscribed faunal regions; indeed, one entire subfamily, the Richardiinæ, is confined to the New World. Species occurring in both hemispheres are very few and every case of such wide distribution is undoubtedly due to dispersal through the agency of man.

Three species are recorded in the Aldrich catalog as common to Europe and North America. Of these *Tritoxa rufipes* Meigen appears to be a doubtful case that needs further evidence. The other two are *Chrysomyza demandata* Fab. and *Seioptera vibrans* Linné. Two American ortalids, *Euxesta quadrivittata* Macq. and *Notogramma stigma* Fab., have been reported from the Hawaiian Islands and are undoubtedly established there. I am now able to report further the establishment of one Oriental ortalid in America, and that of two American species (one of them the *Notogramma stigma* just mentioned) in the Philippine Islands. Omitting the doubtful *Tritoxa rufipes,* it is interesting to note that the species that have obtained a footing beyond their natural habitats are all scavengers for whom the activities of man produce especially favorable conditions. It seems best to discuss the species separately.

Notogramma stigma Fabr.—This striking fly is widely distributed through the warmer parts of America, it having been reported from the West Indies (Fabricius), South America (Wiedemann) and Cuba (Loew). The species occurs in the southern United States. There are specimens in the national collection from Dallas, Beeville and Brownsville, Texas. Recently the species has been reported from Hawaii by Severin and Hartung (Journ. Econ. Ent., Vol. 5, 1912, p. 448) and it appears to have been established there at least as far back as 1907; a specimen form Mr. O. H. Swezey bears the label, "Honolulu, March 2, 1907." The species has now become established in the Philippines as well. Philippine specimens, presumably from the island of Luzon, have recently been received from Mr. D. B. Mackie, of the Philippine Bureau of Agriculture.

But little information on the breeding habits of this fly is available. The specimen from Brownsville, Texas, according to the label, was reared by Mr. D. K. McMillan from *Solanum,* presumably the fruit. A series of specimens from the Panama Canal Zone was reared by Mr. A. Busck from the fruits of a species of palm, *Attalea.* Severin and Hartung in Hawaii (l. c.) have found the larvæ infesting green Chinese bananas that showed decay about the flower-scar.

Chrysomyza demandata Fabr.—This common European species was first reported for North America by C. W. Johnson in 1900, he having found specimens in Philadelphia as early as 1897 (Ent. News, Vol. 11, p. 609). The species is now distributed over practically the whole United States. Specimens are before me from the following localities: Philadelphia, Pa. (C. W. Johnson); Washington, D. C. (R. C. Shannon); Columbia, S. C. (F. Knab); Tallulah, La.; Brewster County, Tex. (Mitchell and Cushman); Mineralwells, Tex. (C. R. Jones); Dallas, Tex. (F. C. Bishopp); Yuma, Ariz. (H. Brown); Lehi, Utah (W. A. Hooker); Lindsay and Visalia, Cal.; Cheney, Wash. (N. D. Showalter).

In the Old World, according to Hendel, the species occurs throughout Europe, in northern and east Africa, Cape Colony, Canary Islands, Seychelle Islands and in Hindostan.

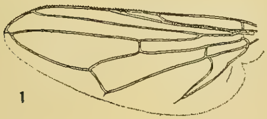
The species is a scavenger and apparently by preference a manure breeder. A number of European observers have reported the larvæ as occurring in large numbers in horse-manure. Rondani states that they occur gregariously in the dejecta of cattle. Specimens recently received by the writer were taken, along with the following species, under conditions which indicate manure-breeding. Josef Mik reports the occurrence of the larvæ of this species in large numbers in fermenting clover, which had been subjected to a rude process of ensilage to destroy the weevils (*Apion*) infesting it (Wien. Ent. Zeit., Vol. 15, 1896, p. 245). C. N. Ainslie found the larvæ in decaying suckers of corn (maize) on the Pima Indian reservation in Arizona. The corn suckers had been previously infested by the caterpillars of *Chloridea obsoleta* and the galleries filled with excrement produced by these provided an excellent pabulum for the *Chrysomyza* larvæ (Proc. Ent. Soc. Wash., Vol. 13, 1911, pp. 118–119). In 1913, A. Weiss reported that in North Africa the larvæ of this species are destructive to the date palm, where the trees had been wounded to extract "palm wine."

"The process of collecting palm wine in North Africa is well known, but it was not known that *Chrysomyza demandata* lays its eggs in gashes made in this palm. The larvæ which hatch from these eggs hollow out the interior of the trunk, feed upon the pith and finally cause the death of the palm. We have seen a number of date palms in a dying condition from this cause." Mr. Weiss found the larvæ present in the palm trunks in thousands, the wet condition of the pith suiting them very well (Bull. Soc. Hist. nat. Afrique du Nord, Vol. 4, pp. 68–69). From the various observations just cited, it is apparent that the larvæ can thrive in a variety of decaying and fermenting substances.

Chrysomyza ænea Fabr.—This species has made its appearance in the United States. It is a native of the Oriental region, where it is very widely distributed. It occurs also in eastern Africa and neighboring islands, and in Australia. Detailed records give Hindostan (Fabricius, Walker), Formosa, Java, Borneo, Malay Peninsula, Mauritius (Hendel), the Philippines (Bezzi), and

Hawaii (Grimshaw). The following Old World localities are represented by specimens in the U. S. National Museum: Honolulu, Hawaiian Islands, March 2, 1907 (O. H. Swezey); Island of Guam (D. T. Fullaway); Manila, Philippine Islands (Brunetti); Telec-Ayer, West Borneo (Brunetti); Lourenço Marquez, East Africa (C. W. Howard); Brisbane, Queensland (Dept. of Mines and Agriculture); Croydon, New South Wales.

As already stated, this species has now become established in at least one locality in the United States. Specimens were first submitted by Dr. B. H. Ransom, of the Department of Agriculture, on August 28, 1915, he having reared them from pupæ obtained from manure at Tallulah, Louisiana. Since then the Bureau of Entomology has caused a series of captures of flies to be made in the vicinity of Tallulah. Most of these catches were taken from mule barns, and nearly every such lot examined contained specimens of this species. Therefore there can be no doubt that the species is well established in this country. *Chrysomyza demandata* occurred in the same captures, but in smaller numbers. The two species evidently have very similar habits. Mr. O. H. Swezey, in Hawaii, has reared *Chrysomyza ænea* from maggots that were very abundant in a manure pile (Proc. Haw. Ent. Soc., Vol. 3, 1914, p. 12).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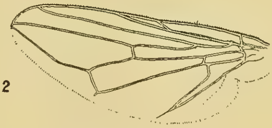
Chrysomyza ænea Fab.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Chrysomyza demandata Fab.

While the introduction of this species into the United States evidently is very recent, it appears from other material that it has been established for some time in tropical America. The National Museum possesses a series from Ceará, Brazil, sent by F. D. da Rocha in July, 1904. The species was therefore without much doubt established on the northeast coast of Brazil at that time. It seems altogether probable that the species is widely distributed in the American tropics, having, most likely, found its way to Brazil by way of Panama and the West Indies. Occurring, as it does, only under special conditions, it would not be likely to fall into the hands of collectors.

Chrysomyza ænea much resembles in general appearance and coloration the more familiar *demandata*. It may be readily recognized by the peculiar venation, the first posterior cell being closed some distance before the margin; in *demandata* the same cell is narrowly open in the wing-margin. (See Figs. 1 and 2.)

Euxesta quadrivittata Macq.

Urophora quadrivittata Macquart, 1835, Hist. Nat. Dipt., Vol. 2, p. 456.

Euxesta annonæ Loew (not Fabricius), 1872, Monogr. No. Amer. Dipt., Vol. 3, 162, pl. 9, fig. 13.

Euxesta annonæ Grimshaw (not Fabricius), 1901, Fauna Hawaiiensis, Vol. 3, p. 44.

Euxesta annonæ Hendel (not Fabricius), 1909, Ann. Mus. Nat. Hung., Vol. 7, p. 155.

Euxesta annonæ Severin and Hartung (not Fabricius), 1912, Journ. Econ. Ent., Vol. 5, p. 448.

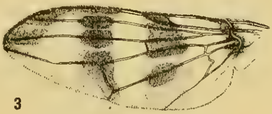
The species reported by Grimshaw and others from the Hawaiian Islands under the specific name *annonæ* is not the species originally characterized under that name by Fabricius. This will be very obvious from a comparison of such specimens with Wiedemann's excellent description of the Fabrician type (Aussereurop. zweifl. Ins., Vol. 2, 1830, p. 463). Apparently Loew is responsible for the transfer of the name *annonæ* to the species under present consideration, and it is only natural that subsequent workers have relied upon his comprehensive and detailed treatment of the genus. Hawaiian specimens before me agree excellently with American specimens from Cuba (type locality), Jamaica and Florida.

The species is a scavenger, so that its wide dissemination is to be expected. Severin and Hartung have reared the flies of this species and of *Notogramma stigma* from larvæ infesting decaying green Chinese bananas in the Hawaiian Islands.

The following species was received from the Philippine Islands, but its original habitat is undoubtedly somewhere on the west coast of tropical America.

Euxesta exilis, new species.

Wings with four transverse fasciæ, the third and fourth connected along both costa and posterior margin. Abdomen blue-black throughout; legs dark.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Euxesta exilis Knab.

Female. Frons narrower than one eye, ferruginous red, the parafrontals dusted with white; ocellar triangle and vertical plates steel-blue; two or three pairs of cruciate bristles. Face and clypeus ferruginous and with pale opalescent blue bloom, the orbits dusted with white. Antennæ bright ferruginous, the third joint ovate, distally very slightly produced above but not forming a distinct angle; arista long, black. Palpi bright ferruginous. Thorax light metallic greenish blue, with a distinct bloom showing yellowish reflections in some lights. Scutellum shining black, smooth, without trace of pruinosity. Abdomen shining blue-black throughout. Front coxæ ferruginous, the others dark. Femora black, broadly ferruginous at apices; tibiæ dull ferruginous, tinged with black, particularly the posterior pair; tarsi dull ferruginous tinged with black, especially distally. Wings (Fig. 3) milky white, with four transverse black fasciæ extending to posterior margin, the first and second separated, the third and fourth connected narrowly along both costa and posterior margin; extreme base of wing whitish tinged with ferruginous; second fascia broad and much widened posteriorly, at costa occupying subcostal cell and tip of costal, its outer margin touching anterior crossvein; third fascia broadened posteriorly and inclosing posterior crossvein; last white interspace narrower than apical fascia; anterior crossvein about at middle of discal cell, which latter is slightly longer than last section of fourth vein; last section of the fourth vein distinctly bent upward in its outer half, the third vein in its opposite portion more gently bent downward, the submarginal cell thereby becoming broader in the margin, the first posterior much narrowed. Calypteres and halteres white.

Length: Body about 4 mm., wing 4 mm.

Philippine Islands, probably Manila, five specimens (Acc. no. 1779, Bureau of Agriculture, Philippine Islands).

Type: Cat. No. 20116, U. S. Nat. Mus.

The genus *Euxesta* has heretofore been considered peculiar to the Western Hemisphere, where it is represented by a large number of species. Hendel, in his Ulidiinæ (Genera Insectorum, 106 Fasc., 1910), lists no less than 54 species and many others are still undescribed. It is therefore safe to assume that the present species is of American origin. Quite likely it was introduced from Mexico in the early days when the Spaniards maintained regular communication between Acapulco and Manila. Botanists have found that on the island of Luzon a large percentage of the introduced plants is from the Acapulco region; it is therefore not surprising that insects whose larvæ thrive in decaying fruit and the like, such as *Volucella obesa, Notogramma stigma* and this *Euxesta,* also have been introduced.

In all the specimens before me the wings show, within the transverse dark fasciæ, black blotches upon a pale gray ground, as shown in the figure. Finally, it may be added that in the national collection there is a series of a closely related but distinct species, still undescribed, from Aguascalientes, Mexico.

Seioptera vibrans Linné.—This species is generally distributed through Europe and in North America occurs over the northern part of the continent, ranging at least as far south as Washington, D. C. This fly occurs abundantly in certain localities; it has a characteristic habit of resting on the under surface of the leaves of trees and vibrating its wings. In spite of its wide distribution and frequent local abundance there are few observations on the life-history. Scholtz reared the flies in large numbers from a mixture of horse-manure and earth (Zeitschr. Ent., Breslau, 1849 and 1855). Sintenis, nearly forty years later, reported it as occurring regularly under the windows of manure-beds or cold-frames, thus confirming the record of Scholtz (quoted by Mik, Wien. Ent. Zeit., Vol. 6, 1887, p. 216). Karsch, upon information from a correspondent, reports the larvæ in destructive numbers burrowing in the stems of *Dianthus carthusianorum* (Berlin, Ent. Zeitschr., 1887, Sitzgsber., p. xxviii). No doubt this last record has its origin in a faulty observation; most probably the puparium sent to Karsch came from the manured earth and the damage to the plants was due to some other cause.

NOTE ON THE HABITS OF PSITHYRUS VARIABILIS CRESS.

By Theodore H. Frison, Champaign, Ill.

In the Canadian Entomologist for March, 1915, Mr. F. W. L. Sladen records finding *Psithyrus insularis* Sm. in the nest of *Bombus flavifrons* Cress. opened July 7, 1914, at Agassiz, British

Columbia. Mr. Sladen points out that this is the first reported occurrence of a *Psithyrus* inhabiting a nest of a *Bombus* in the New World.

In addition it might be well to record the finding, by myself, of both sexes of the *Psithyrus variabilis* Cress., inhabiting the nest of *Bombus pennsylvanicus* De Geer at Champaign, Illinois. During September, 1910, I had occasion to open several surface nests of *Bombus pennsylvanicus*. Of a total of seven nests, four contained *Psithyrus variabilis*. Again, on September 14, 1915, one female of *Psithyrus variabilis* was found in a surface nest of *Bombus pennsylvanicus*. In one of the nests examined September, 1910, were found thirty males and twelve females of *Psithyrus variabilis,* along with fifty-one *Bombus*. In the other three nests the number of inquilines varied from one to five. In the same nest containing the *Psithyrus* females, were to be found the living *Bombus* queens. Apparently, as in the case of the *Psithyrus insularis,* the female of *Psithyrus variabilis* does not kill the queen *Bombus*.

Hibernating Hydrophilidæ.—Mr. Fred Wintersteiner, who is studying the habits of this family, reports the capture near Richmond, Va., during the last week of January of adults of *Philhydrus nebulosus, P. ochraceus, Tropisternus glaber, T. lateralis, Creniphilus subcupreus,* and *Cymbiodyta fimbriata.*

WANTED.—All kinds of material for Life Histories. Lepidoptera, Coleoptera, Hyneoptera, Diptera, etc., etc. Herman H. Brehme, 74 13th Avenue, Newark, N. J.

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BULLETIN
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Vol. XI June, 1916 No. 3

ENTOMOLOGY AND LITERATURE

By Annie Trumbull Slosson, N. Y. City.

I am not going to write of entomological literature; we know all about that—sometimes more than we wish perhaps. But I want to speak of these two subjects as quite separate things, the study of insects and belles lettres. I am led to do this by certain happenings, some of them seeming to show how far apart these two are, some proving that they are closely akin. In the first place I, myself, have been surprised again and again by coming across the name as author, on title page of book, or at head of magazine essay, of someone I had known previously only as an entomologist. In the boulders of the far west dwells a man who knows more about hymenoptera than do the bees and wasps themselves. Beside his entomological papers, he has written charming literary essays with not a sting or waspish allusion therein, but a store of honey will reward the reader. I read, some years ago, a clever detective novel, full of crime and mystery. Not till I had finished the volume, solved the problem, and found out who " did it," had I turned to the title page for the name of the author. Fancy my amaze when I saw that our authority on the *Plusia* group had deserted for the nonce his silver-lined, gold-touched favorites and, as a little Vermont boy I once met used to say, " done a book." He wrote others too, books with not, if I remember rightly, a lepidopterous allusion, a noctuidic touch, a hint of moth from *Panchrysia* to *Syngrapha*.

And we have another insect student, an expert and authority in Coleoptera who turns out books with not a beetle in them. They do not treat of elytra, gauzy wings, femora and tarsi as means of locomotion but tell of wheels, tires and treadles, about which he "knows it all." Yet, at heart I really believe that—to parody rather irreverently lines of a great poet—he would say from his heart

Better beetles far of Europe
Than a *cycle* of Cathay.

I have a delightful little book called "Days Afield." It deals with nature, but not entomological nature only, tells of the woods and streams and fields of that island of which the author is the Gilbert White of Selborne memory. He could not, being what he is, leave out all hint of butterfly, beetle, bug,—but there is more of bird and blossom than of insects. The book was written several years ago; perhaps its author would not, could not now, be so conservative; could not banish to silence from his pages the shrilling of the cicada, the jarring of the "jar-fly."

Several English entomologists have written books on subjects quite apart from the branch of natural history to which their authors were devoted, indeed apart from natural history itself. One, at least, wrote poetry, odes, sonnets, even hymns, in which not a cricket chirped, bee hummed, fly buzzed, or beetle stridulated. Few who knew and sympathized with him as an entomologist dreamed of his being a poet, and those who read and loved his verse had little knowledge of his taste for "bee and moth and flying thing." Grote, so well known as a student of lepidoptera, was also a poet, writing pleasing and rhythmical verse. Many years ago, in the very earliest days of the New York Entomological Society, I took with me to one of its meetings, a guest staying at my home. It was Charles Dudley Warner, just then at the height of his fame as a delightful writer of essays, a charming teller of stories. I introduced my distinguished friend to one or two of the members before the meeting opened and presently one of them drew me aside and asked the visitors's name as he had not caught it. When I repeated it with pardonable pride the eager entomologist said, "Yes, of course I've heard his name but forget his line. Is it coleoptera?" Poor Mr. Warner! It was a lesson to him—for you may be sure I made the most of it after the meeting—and I can hear him now say, as he said then with his whimsical smile, "There's a man who would despise me if he knew I have not an idea what coleoptera is. I only write things." Many hobby-riders who also "write things" have had similar experiences.

Entomology and literature work well together in harness, each being a good "running mate" for the other. Some authors are troubled to find names for their stories, titles for their books. An entomologist need never be at a loss in the matter. Let him take a volume at random from the shelf which holds his bound magazines. He will find it bristling with suggestions, scintillating with bright hints. Ah, the stories I have wanted to write as I looked over the index of some one of our journals. What an epic I might write on "The Song of Thyreonotus" from an old magazine; it is a whole Greek tragedy in itself. I wrote—mentally and with not a pen in sight—a weird tale with the title stolen from the Canadian Entomologist, "Aberrations of Vanessa." She had many idiosyncrasies, this Vanessa, heroine of my psychological story, still unwritten. "The Coulee Cricket" suggested an irrepressible cowboy bearing that nickname because of his nimble escapes from dangers such as prisons, police and such. "The Capture of Monodontomerus" is a taking title for an Indian romance. "Cannibalistic Tendencies of Certain Females" suggests a tale of lady vampires or ghouls, and "A Flight of Water Boatmen" is not a bad name for a sea story. These things show, I think, how entomology may help the literary man. As to the reverse, how a literary touch adds to the charm of entomological writings, need I try to prove it? Several of the writers for this and for our other journals make of their papers concerning dry, technical subjects, delightful essays, real idyls. Some of our fellow naturalists in Canada write such papers, published in the annual report of their society, and I read them with great pleasure enjoying them as I do the essays of Thoreau, Burroughs, Muir and Bradford Torrey. A certain orthopterist in a New England town often gives a delightful literary touch to his scientific descriptions, making the reader see sporting elves, fairies or brownies, in green or wood color, instead of leaping insects with their polysyllabic titles.

In an article published in Psyche more than twenty years ago on the orthoptera of certain islands off the Massachusetts coast this specialist spoke of the cruelty shown the sea birds there by summer visitors. These mutilated the young terns, severing their wing-tips to carry home as mementoes and leaving the crippled victims suffering and helpless. And he wrote: "The shadow of a tern's wing is but slight and its hue is that of the surf along the shore, yet it might well forever cloud the memory and darken the record of the heartless wretches who practised such devilish cruelty upon the helpless innocents of Penikese."

In your own BULLETIN a writer who has delved into the past has brought out wonderful treasures from Egypt, from Greece, from sages and poets of olden days, even quoting Sanscrit freely in his writings as if it were his native patois.

It has been a sort of fashion these last years, the introduction of entomology into fiction. I have come across several novels lately in which the hero or some subordinate character is a collector of insects. One such book is "Mr. Hobby," published a year or two ago. And Joseph Conrad, in his "Lord Jim," introduces such a character, a merchant named Stein. The author describes the hero's room with its "dark boxes of uniform shape and color on narrow shelves," and speaks of his "Buprestidæ and Longicorns, horrible miniature monsters, looking malevolent even in death." What do Messrs. Schaeffer, Leng, *et al.* think of that description of their beautiful favorites? Just fancy calling our brilliant *Buprestis rufipes* or *fasciata* or any species of our graceful *Strangalia* or *Bellamira,* horrible and malevolent!

But I must stop here. This is a wandering, erratic sort of essay, and, as I look back over it I see that its title it most misleading. For surely it is not entomology and just as surely no one could call it literature.

THE VELIINAE OF THE ATLANTIC STATES

By J. R. de la Torre Bueno, White Plains, N. Y.

In a previous paper* the larger forms of the Gerridæ, the subfamily Gerrinæ, were considered; here we deal with those minute species so seldom seen at large and still more infrequently in collections. They dwell, as do their larger cousins, wherever there is water to bear them on its elastic surface, except that, being far smaller, they do not require such wide reaches for a contented existence. Some may be found in the narrow confines of springs and water-holes; others in swift streams where the ripples braid the waters; or again, in salt coast estuaries; and finally, certain ones seek the shelter of vegetation growing in slow-moving streams, or on the edges of ponds. None, however, counts among its members such daring navigators as there are among the larger Gerrinæ. In the eastern United States, these small forms are apparently as numerous in species as the larger; it is even possible that there are more of the former, since the much more noticeable Gerrids are far likelier to be collected than the inconspicuous atoms here dealt with. The subfamily is divided into three genera, which may be separated by the following key:

---

* 1911, "The Gerrids of the Atlantic States (Subfamily Gerrinæ)," Tr. Am. Ent. Soc., XXXVII, No. 3, pp. 243-252.

1. Anterior tarsi 2-jointed; last antennal joint longest..*Microvelia* Westw.
2. Anterior tarsi 1- or 3-jointed; first antennal joint longest.
3. Anterior tarsi 1-jointed; intermediate tarsi longer than last, 3d joint split and with feathery hairs set in split..........*Rhagovelia* Mayr
4. Anterior tarsi 3-jointed; intermediate tarsi longer than last, but not split and without feathery hairs........................*Velia* Latr.

Velia Latreille, 1804, Gen. Crust. Ins., III: 133.—This genus is represented in the Atlantic States by only two species, neither of which is known as yet north of the vicinity of Washington, D. C. Little seems to be known in regard to them. Miall limits his remarks on the European *V. currens* to stating that it swims under water more readily than *Gerris* and walks back-downward on the surface film. The genus is dimorphic as to wings, which, of course, makes certain structural changes in the thorax. Like all their congeners, the species of the genus are predaceous. So far as known, they are stream forms, as denoted by the names of the two Europeans, *currens* and *rivulorum*. These congregate in small schools, though our own have been taken only by ones and twos. The European species overwinter as adults in moss on stones. The eggs are deposited in spring on the vegetation coming to the surface.*

* C. Wesenberg-Lund, "Fortpflanzungsverhaltnisse: Paarung und Eiablage der Susswasserinsekten," Forts. Nat. Forsch., Halle, VII: 196.

The species thus far recognized from the eastern United States may be separated by the following key:

1 (2). Intermediate tarsi subequal to or but little longer than posterior, joints 2 and 3 subequal; second joint of hind tarsi longer than third........................*V. stagnalis* Burm., Heid., Bueno

2 (1). Intermediate tarsi much longer than posterior, joint 2 much longer than 3; joint 2 of hind tarsi shorter than 3; (first joint of antennæ nearly one and a half times as long as second). *V. australis* n. sp.

Velia stagnalis Burmeister, 1835, Handbuch, II: 212.—So far, this species has been taken only in the apterous form. Before me are two specimens, one from Washington, D. C. (Heidemann), and the other from Raleigh, N. C. (C. S. Brimley). Burmeister records two specimens from near Philadelphia, and it is also stated to be found in Cuba. I know of no life history notes or details of habitat.

Velia australis n. sp.—Head triangularly obtusely produced with a median impressed line; eyes globose, a little less in diameter than the distance between them. Antennæ slender, first joint stoutest, longest, curved; second joint thinner than first, but stouter than third and fourth, shortest; third and fourth joints slender, of nearly equal thickness throughout, subequal in length; all pilose and setigerous.

Thorax faintly carinate, roundedly produced posteriorly, deeply punctured; two transverse impressions before the middle, the posterior with four deep foveate punctures; lateral angles prominent.

Hemelytra (or tegmina), narrower and slightly shorter than abdomen, with slight distinction of texture between corium and membrane.

Femora stout, anterior shortest, intermediate longest; all the tibiae are longer than the corresponding femora; intermediate tarsi longest, anterior shortest, first joint in all minute, second joint longest in second and third pair of tarsi, third joint in first pair.

In the middle section of the metapleuræ is an obscure and scarcely distinguishable opening, protected by three long black upwardly curving spines, which can be seen from above. This is a distinguishing character of this species, as it is apparently not found in other American forms described and in the four or five known to me in nature.

Color brown; silvery pilose: posterior connexival edges from third to sixth segment (only fourth to sixth visible in winged), an interrupted streak on the connexival suture beneath; luteous: antennæ, coxæ, trochanters, base of rostrum and bands on legs and bases of all femora, remainder of legs infuscated. Hemelytra fuliginous with sparse golden pubescence on corium; corium with a narrow apical white streak; membrane smoky with three white spots at apex, the central one cordate and deeply emarginate, the two lateral ones irregularly rounded and nearer the apex of the membrane. Veins concolorous.

Apterous form: Pronotum stout, transversely impressed about one fourth its length from the anterior margin, two longitudinal impressions from the anterior margin at the eyes meet it, producing deep foveae at the points of juncture; rounded truncate posteriorly with a somewhat broad explanate margin. Six abdominal segments and two genital visible dorsally, six ventrally (as in the winged), segments except the first of nearly equal length, abdomen widest at fifth and sixth segments, with two deep longitudinal lateral grooves. Connexival edges blunt, rounded; genital segment quadrilateral, twice as broad as long, truncated, with the second genital segment projecting beyond like a small blunt knob. Other structural characters as in the winged, except two small, triangular wing-pads.

Color brown as in the winged, except that the specimen in hand is somewhat darker in shade. Silvery pilose, two small anter-lateral patches on pronotum, posterior connexival edges from second to sixth segment, posterior middle of third dorsal segment, broadening in fourth and broadly lateral in fifth and sixth, fifth segment with a small posterior median patch. Milk white, vestigial wing pads projecting beyond posterior edge of pronotum. Winged, long., 5.3 mm.; lat., 2 mm. at humeri. Apterous, long., 5 mm.; lat., 1.7 mm.

Described from one winged male, "Fla., Wagner—E. I.", with last two joints of antennæ missing; and one apterous male, with two joints of right antennæ missing, from Spring Creek, Decatur Co., Georgia, June 7–23, 1912. J. C. Bradley.

Type, winged male in my collection.

Paratype (and morphotype), apterous male in collection J. C. Bradley.

Rhagovelia Mayr. 1865, Verh. zool. bot. Ges. Wien, XV: 445.
Bæcula Stål, 1865, Hem. Afr., III: 167. *Neovelia* F. B. White, 1879, Journ. Linn. Soc. Lond., Zool., XIV: 487. *Trochopus* Carpenter, 1898, Ent. Mo. Mag., XXXIV: 78.

Rhagovelia, next to *Rheumatobates,* is perhaps the most interesting genus of the waterstriders in regard to special adaptation to a peculiar habitat, to be found only in running streams. The species are dimorphic, but in our latitude the fully winged are rarely seen. Little is known as to their breeding habits or other phases of life. The Atlantic States forms are easily separated, aside from the difference of habitat, by the following key:

1. Intermediate and hind tarsi third joint longest; hind femora incrassate and spinose in both sexes; very dark in color and with a more or less æneous luster.................................*R. obesa* Uhler

2. Intermediate and hind tarsi second joint longest; hind femora scarcely incrassate in both sexes, not spinose; lead gray in color (subgenus *Trochopus* Carpenter)......................... *R. plumbea* Uhler

Rhagovelia obesa Uhler, 1871, Proc. Bost. Soc. Nat. Hist., XIV: 107. This species is found in the rapid parts of streams throughout the Atlantic States. In such places, they congregate in schools, swimming powerfully in zig-zags against the current, or at times sheltered behind some outjutting rock, placidly paddling in the eddies that swirl about it. The peculiar tarsal plume in this species and its striking function are described in detail in the Canadian Entomologist.* This is a difficult form to confine in an aquarium, as it immediately takes to diving and finally perishes. *Rhagovelia obesa* is sometimes found winged about New York, but so rarely that my fifteen years of collecting have yielded only seven. It is perhaps the most widespread species of the genus and it has been suspected that some of Champion's Central American species may be but unrecognized variants of it. Central America seems to be the metropolis of the genus, as most of the known species are thence. It has been recorded from all the Atlantic States except Florida and is known from Canada.

Rhagovelia (*Trochopus*) **plumbea** Uhler, 1894, Proc. Zool. Soc. Lond., p. 217 = *Trochopus marinus* Carpenter, 1889, Ent. Mo. Mag., XXXIV: 78, pl. 3. This species is a denizen of estuaries, bays and other brackish or salt waters on our southern coasts and about the Antilles. There is only one other with a like habitat, *Rh. salina* Champ., which is found on the Central American coast cays. Nothing further seems to be known of its habits. Its leaden hue alone is enough to distinguish it from its near relatives.

Microvelia Westwood, 1834, Ann. Soc. Ent. Fr., III: 647. *Hydroëssa* Burmeister, 1835, Handbuch, II: 213. *Veliomorpha* Carlini, 1895, Ann. Mus. Civ. Gen., XXXV: 120. This genus contains not only the smallest of the waterstriders, but also of all the water-dwellers among the Hemiptera. It is very likely the most abundant as to numbers and species, and the most widely distributed, since it is known from all the continents and nearly all the islands in every zoological region. Be it pond, lake or stream, it is always possible to secure them hiding among the grasses or walking about the banks or stalking their game on the green fields of duck-weed floating on some placid pool. This genus also is dimorphic, the winged and wingless so notably different that they have frequently been taken for distinct species. However, in the antennæ we have such excellent characters that it is always possible to bring together both forms of any one species and to differentiate them from others, though closely related. This character is largely employed in this key to the species of Microvelia:

---

* 1907, on *Rhagovelia obesa* Uhler, Vol. XXXIX: 61–64.

1 (2). Antennæ comparatively short and stout, not exceeding length of head and thorax taken together; legs short and stout. *M. atrata* n. sp.

2 (1). Antennæ slender, of varying lengths.

3 (4). Posterior tibiæ curved in male, straight in female; antennæ short, not as long as head and thorax taken together; apterous male, long, slender, fusiform, female, short, broad, nearly orbiculate. *M. borealis* n. sp.

4 (3). Posterior tibiæ straight in both sexes.

5 (8). Posterior tarsi 3-jointed.

6 (7). Antennal joint 3 longer than 1, 4 subequal to 2 and 3 taken together; joints 3 and 4 slender, equally stout and of the same diameter throughout, 4 tapering at the end, antennæ very long; hemelytra much marked with white................*M. albonotata* Champ.

7 (6). Antennal joint 3 subequal to 1, 4 shorter than 2 and 3 taken together, stouter than 3, fusiform; apterous form with dorsal patches of blue-gray pile...................*M. fontinalis* n. sp.

8 (5). Posterior tarsi 2-jointed; antennal joints 1 and 3 subequal, 4 much shorter than 2 and 3 taken together; apterous form with dorsal patches of silvery white pile; winged form with unicolorous hemelytra...............................*M. americana* Uhler

Microvelia americana Uhler, 1883, Stand. Nat. Hist., II: 274. This species may be further separated from its relatives by the fourth antennal joint longer than 3d, and 1 than 2, 2 being the shortest; 3 is the thinnest, the others of nearly equal diameter and 1 slightly curved. The hind femora extend slightly beyond the apex of the abdomen; the hind tibiæ are straight in both sexes, and the hind tarsi two-jointed. Its life-history and habits have been detailed before.*

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* 1910, Canadian Entomologist, XLII: 176–186.

The species ranges over all the Eastern States south to Florida and west to the Mississippi. It has been found in Colorado and is said to occur in Texas. The southwestern records, however, should be confirmed by careful study.

Microvelia fontinalis n. sp.—Apterous form: Head nearly as broad as long; white pile next to eyes. Eyes round, small, prominent, black; ocelli close to eyes.

Antennæ nearly half as long as the entire insect; joints 1 and 2 subequal, 1 shortest, 3 longer than 2, 4 longest; joint 1 stoutest, 2 following, 3 slender and 4 stouter than 3, fusiform; all joints more or less pilose, especially 4.

Thorax longer than first three dorsal abdominal segments. Femora in all three pairs of legs stouter than tibiæ, hairy, all tibiæ straight. Femora flavous toward base, tibiæ entirely fuscous.

Six abdominal dorsal segments visible, first and second dorsally with lateral patches of fine blue-gray pile; five and six with a median large patch, nearly covering the entire segment; all segments margined with black; first four segments brown above; all segments a lighter brown on the underside, covered with a sericeous pile. Connexivum strongly reflexed in both sexes, more so in the female; spiracles visible at connexivum; male genital segment not very prominent. General color fuscous, strongly pilose.

Type, female taken at White Plains, Westchester Co., N. Y., June 30, 1912; paratypes, four specimens same place, same date, two Westfield, N. J., September 3, 1904.

Long., 2.3 mm.; lat., 1.1 mm. at widest part.

Only the wingless form is known. It was taken in numbers in a spring in a marshy woodland, where it clings to the long mosses growing into the water or walks about leisurely a short distance from the rocky sides of the basin. The blue-gray patches of pubescence on the dorsum are distinguishing characteristics. The characters given distinguish it from *M. americana*, for small specimens of which it might be mistaken. In antennal structure it is near *M. albonotata.*

Microvelia albonotata Champion, 1898, Biologia Centrali Americana, Heteroptera, II, pp. 127, 129, pl. VIII, f. 7, winged form. =*M. capitata* Bueno, Heidemann in Insects of N. J., nec Guérin, for the apterous form.

Apterous form: Connexivum strongly reflexed, with brown patch on each segment; dorsum black, except three last abdominal segments, which are broadly greenish, the last entirely so. Genital segment large, prominent. Thorax tumid, mesothorax rounded behind; metathorax straight, form narrow, abdomen subparallel. Male, Morphotype, male, Fort Lee district, N. J., Oct. 10, 1903.

Apterous female: Differs from the male in having the abdomen posteriorly roundedly truncate; form obovate. The specimen in question has the dorsum nearly entirely a deep velvety black; another specimen shows but little black. Morphoparatypes, 2 females, Fort Lee District, N. J., Oct. 10, 1903; Fly Creek, N. Y., August 29, 1906.

This species was described from a single winged male from Guatemala. Subsequently recorded from Riverton, N. J., by Van Duzee, the writer later secured it at Westfield, N. J. The specimens from the United States agree with a Mexican in collection Kirkaldy.

In this species, as in the other, the most obvious character is in the long thin antennæ. It cannot be mistaken for any other species, being the largest of our eastern forms, except *americana,* from which its slim body, long thin antennæ and white-spangled hemelytra at once distinguish it. The apterous are more glabrous and much less velvety in appearance than the winged. It is also known from Georgia, taken by Dr. J. C. Bradley.

Microvelia borealis n. sp. = *M. pulchella* Bueno et auctt. Am., nec Westwood.

Head with an impressed line down the middle; antennæ slender; not quite as long as head and thorax taken together; joint 1 stoutest, 3 slenderest, 2 and 4 nearly equal in thickness, the last fusiform; joint 2 shorter than 1, which is subequal to 3 and shorter than 4, the longest; a white line next the eyes. Pronotum as long as broad, with a distinct collum, rounded behind, humeral angles prominent, tumid. Both head and thorax velvety black, except for the silvery stripe next the eyes in the former. Eyes round, diameter half the distance between them. Hemelytra as wide as abdomen, entirely membranous; nervures prominent, black, cells gray except apical which is white. Femora slightly stouter than the tibiæ, legs pilose, posterior tibiæ curved, bases of femora lighter in color. Genital segment prominent. Fusiform in shape.

Long., 1.6 mm.; lat., .7 mm. at humeri.

Type, winged male, taken at Cranford, N. J., on the Rahway River, August 8, 1904.

Winged female: Differs from the male principally in the broader form, sides of abdomen subparallel and more or less curving; hemelytra do not quite cover connexivum; posterior tibiæ straight.

Long., 2 mm.; lat., .8 mm.

Allotype, winged female, Staten Island, N. Y., August 19, 1905.

Apterous male: Fusiform, pronotum tumid, divided by distinct sutures into three segments; mesonotum with a deep suture behind middle, directed anteriorly at each end; genital segment prominent; abdominal segments subequal. Velvety gray black in color.

Long., 1.9 mm.; lat., .7 mm.

Morphotype: Apterous male, from Staten Island, same date.

Apterous female: Orbiculate, genital segment truncate; gray and black coloring, much more marked and definite than in male.

Long., 1.6 mm.; lat., 1.1 mm. at widest part.

Morphoparatype: Apterous female, Staten Island, N. Y., June 3, 1905. Nine other paratypes of both sexes and forms from Westfield, N. J., Yaphank, L. I., and Staten Island.

In all the underside of the head, pro- and mesosternum are yellowish, as well as the coxæ, trochanters and greater part of femora.

This species has appeared in the writer's papers as *pulchella* Westwood, from which it may be separated, aside from being smaller by having joint 1 of antennæ longer than 2. The former, so far as is known, is only Antillean in distribution.

It is perhaps the most abundant of our native Microvelias, and it may always be found in large colonies on the matted *Lemna* on still ponds. It is just as predaceous as its larger congeners and is most frequently found in the wingless form, although the fully winged is not rare. It begins to breed on emergence from its winter quarters, and lays its eggs end-to on the underside of the duckweed leaves with the head toward the edge, in the usual gelatine. The nymphs emerge in 8 to 13 days, and after *four* molts reach the adult in about 16 days minimum, or 24 days from the egg to the adult, which would allow for eight generations in a summer. One female may lay several batches of eggs; her progeny may be found in various instars at the same time.

Attention is directed to the unusual number of molts, as the general rule in Heteroptera is five.

Microvelia atrata n. sp.—Head comparatively short and broad; eyes round, rather prominent; antennæ short, rather stout, not much longer than head and thorax taken together, joint 1 stoutest, 3 thinnest, 2 shortest, 4 longest, fusiform, 3 shorter than 4 and subequal to 1, which is longer than 2. Pronotum not much produced, rounded behind; humeri prominent. Collum yellowish with narrow black median line; suture before middle of thorax grayish pilose. Hemelytra not so wide as abdomen, corium and clavus milk-white at base, a white patch in the middle cell. Legs comparatively short and stout, tibiæ straight in both sexes. Subparallel in shape.

General color, sooty black; pronotum narrowly flavous toward apex; connexivum flavous edged with black above and below; grayish black pilose beneath; femora light yellow basally.

Long., 2 mm.; lat., .9 mm. at humeri.

Type, female, Billy's Island, Okefenokee Swamp, Georgia, June, 1912, collected by J. C. Bradley.

Allotype, male, differs from female in having the genital segment rounded and slightly prominent. Same locality and date.

Long., 1.7 mm.; lat., .8 mm. at humeri.

Apterous male, subparallel in form; genital segment visible from above, small, not very prominent; a glabrous indentation in the last abdominal segment; connexivum not much reflexed; prothorax short with two more or less obscure transverse sutures. Vestigial wings visible at posterior edge of thorax as two minute milk-white pads. Entire insect brown pilose.

Long., 1.6 mm.; lat., .8 mm. at widest part.

Morphoparatype, apterous male from same locality, same date.

Apterous female, differs from male in form, which is obovate, and in the shape of the genital segment, which is visible from above.

Long., 1.8 mm.; lat., .9 mm., at widest part of abdomen.

Paratype, same locality and date as type.

Additional paratypes, four specimens of the forms.

This velvety black species was secured in numbers by J. Chester Bradley and so far is known only thence.

In conclusion, it should be noted that not much stress is laid on color characters, except those of the hemelytra, which are a fairly reliable guide in ordinary specimens, but as dark ones are frequently found, this character should not be considered final. The two apparently stable characters are the size and the antennæ. Even here, care should be taken, since the comparative length and thickness of the antennal joints one to the other may frequently vary. For this reason they are not expressed herein in definite lengths, but the proportion between the joints of the same antenna remains.

Prof. Herbert Osborn, of the Ohio State University, and Managing Editor of the Annals of the Entomological Society of America, has issued his new book, Agricultural Entomology, published by Lea & Febiger, Philadelphia and New York, price $2 net.

While designed for students, farmers, fruit growers and gardeners, the book can well be added to the working library of any entomologist or collector in any order. The illustrations, 253 in number, are especially notable.—Ed.

NEW SPECIES OF THROSCIDÆ (COL.).

By Charles Schaeffer, Brooklyn, N. Y.

Four species of *Drapetes* are credited to our list to which two more have to be added. A new species from Lower California, which differs from the Mexican and Central American species having no carina at the hind angles of prothorax by the position of the red spots and by this and the non-carinate hind angles of prothorax from the North American species. Of the Mexican *D. niger* I have taken a few specimens at Brownsville, Texas.

Two new species belonging to other genera are also added. One of them, a fairly common species of *Throscus* in the east, was labeled "n. sp." by the late Frederic Blanchard.

Table of the Species of Drapetes Redt.

1. Carina of hind angles of prothorax long, extending to about two thirds to apex 4
   Carina of hind angles short or absent 2
2. Hind angles of prothorax without carina; color black, humeri with a small, red spot .... **ecarinatus** n. sp.
   Hind angles of prothorax carinate, carina not extending to the middle..3
3. Prothorax red, elytra black without spots.......... **rubricollis** Lec.
   Prothorax black; elytra black, with two large sub-basal and two smaller subapical red spots.......... **quadripustulatus** Bonv.
4. Elytra with two large, oblique, red sub-basal spots, which often unite at suture .... **geminatus** Say
   Elytra without red spots 5
5. Elytra without fascia of white hairs below middle.......... **nitidus** Melsh.
   Elytra with fascia of fine white hairs below middle.......... **niger** Bonv.

Drapetes ecarinatus new species: Black, elytral humeri with a red spot. Head sparsely punctate. Prothorax at base slightly wider than long; sides feebly arcuately narrowing to apex; hind angles without carina; surface moderately coarsely and densely punctate; punctures finer towards apex; below coarsely and rather densely punctate at sides. Elytra gradually narrowed from base to apex; disk irregularly punctate, punctures finer than those on prothorax. Metasternum sparsely punctate, punctuation a little denser and coarser at sides. Abdomen rather sparsely punctate and pubescent. Length 4.6 mm.

El Taste, Lower California (G. Beyer).

Drapetes niger Bonv.: This Mexican species, which occurs at Brownsville, Texas, is a little narrower than our eastern species, the color is black, with the first joint of antennæ pale. Prothorax rather coarsely punctate and the elytra with a fascia of white hairs below middle. Length 3.5 mm.

Aulonothroscus rugosiceps new species: Piceous, moderately shining, surface moderately densely pubescent. Head coarsely and densely punctate, more or less distinctly carinate laterally near each eye and also with a short, irregular carina at middle; eyes entire. Prothorax about twice as wide as long; sides arcuately narrowing from base to apex; hind angles with a relatively long carina; surface moderately coarsely but not densely punctate, intervals between the punctures minutely punctulate. Elytra slightly narrowing posteriorly; striæ very feebly impressed, almost obliterated on the disk; intervals irregularly punctate with very minute punctures intermixed. Prosternum very sparsely punctate; lateral striæ deep, parallel and entire. Metasternum and abdomen rather coarsely punctate. Length 4 mm.

Brownsville, Texas (O. Dietz).

The entire eyes and the long, entire prosternal striæ relate this species to *A. constrictor,* from which it differs in the distinctly carinate hind angles of prothorax, the carinate head and the absence of the basal impression, which is very pronounced in *A. constrictor.*

The head is unusually coarsely punctate with the punctures here and there confluent.

Throscus carinicollis new species: Brown, feebly shining, surface densely but not coarsely pubescent. Head sparsely punctate in front with a rather distinct carina near each eye; eyes nearly divided. Prothorax wider than long, sides feebly arcuate and rather strongly narrowing from the basal to the anterior angles; basal angles rather strongly carinate; disk moderately coarsely punctate, on each side of middle near base a more or less distinct impression. Elytra scarcely narrower than the thorax, slightly narrower posteriorly; surface punctate striate; intervals biseriately punctate with larger punctures, intermixed with very minute punctures. Prosternum sparsely punctate near apex, punctures absent or obliterated in about basal half; striæ deep, entire and nearly parallel. Metasternum and abdomen moderately coarsely punctate. Length 3 mm.

Elk Co., Pennsylvania.

This species is very close to *chevrolati* from which it differs in having a very distinct carina at the hind angles of prothorax, less coarse pubescence and punctuation and a more distinct antescutellar impression at base of prothorax.

I have also specimens from New Jersey.

ŒDALEOTHRIPS HOOKERI, A NEW GENUS AND SPECIES OF THYSANOPTERA.

By J. Douglas Hood, U. S. Biological Survey.

Œdaleothrips gen. nov.

(*οἰδᾰλέος*, turgid; *θριψ*, a wood worm).

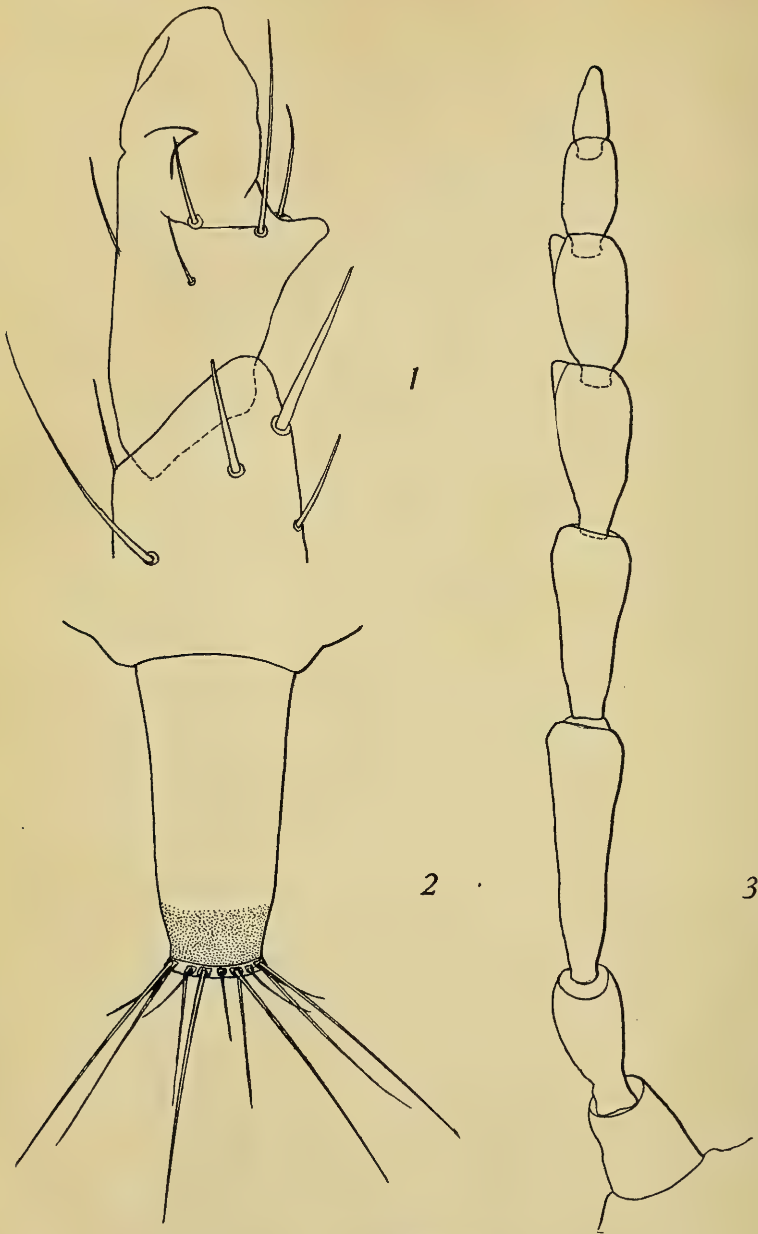
Head about one and one half times as long as wide, much narrowed at base and broadest across eyes, about twice as long as pronotum and about equal in width to pterothorax; vertex rugose; postocular bristles short, sublateral, equal in length to a forwardly-directed pair near base of antennæ. Antennæ eight-segmented, segments 4–6, with ventral prolongations at apex; segment 3 longest. Eyes rather small, flattened, protruding, produced posteriorly on ventral surface of head, widely separated. Mouth cone short, semicircularly rounded at apex, about attaining middle of prosternum. Prothorax unusually narrow and about two thirds as long as wide; usual bristles all present but reduced in size. Pterothorax greatly reduced, about as long as broad and about equal in width to head. Fore tarsi armed with a short, stout tooth. Wings wanting in the genotype. Abdomen broad and heavy, with dorsal white blotches; tube about half as long as head.

Genotype: *Œdaleothrips hookeri* sp. nov.

Closely related to *Cryptothrips* Uzel (type *C. lata* Uzel, by present designation), and no doubt derived from that section of the genus which includes *dentipes* Reuter, *bicolor* Heeger, and *gilvipes* Hood. The swollen head (which has suggested the generic name), the reduced pterothorax, and the enlarged abdomen give the insect a truly ant-like appearance, and serve to distinguish it readily from described forms.

Œdaleothrips hookeri sp. nov. (Pl. 2, Figs. 1–3.) *Female* (apterous).—Length about 2.6 mm. Head and thorax dark blackish brown; abdomen coal black, with first segment pale yellow and tube lemon yellow, tipped with black, dorsum with three pairs of chalky-white dorso-lateral blotches, on segments 2, 5, and 6, respectively, the blotches on 1 linear, the others rounded, the pair on 5 largest; antennal segments 1 and 2 pale yellowish, 3 orange-brown in basal half, becoming blackish brown at apex, remainder of antenna black.

Head about 1.5 times as long as wide, elevated and swollen behind eyes, narrowed posteriorly, and at base with neck-like constriction; dorsal surface rugose in the vertical region, reticulate posteriorly; vertex nearly flat; postocular bristles small, almost lateral, capitate, similar to a forwardly-directed pair near base of antennæ. Eyes flattened, protruding,



A NEW THYSANOPTERA — HOOD

produced posteriorly on ventral surface of head, widely separated, about half as wide as their dorsal interval. Ocelli wanting. Antennæ about 1.4 times as long as head, formed almost exactly as in *Cryptothrips gilvipes* Hood;* sense cones short.

Prothorax about half as long as head and (inclusive of coxæ) about 1.6 times as wide as long, declivous posteriorly; usual bristles all present, similar to postoculars. Pterothorax greatly reduced, about as long as broad and about equal in width to head; mesonotum nearly smooth, metanotum with heavy concentric anastomozing striæ. Legs about concolorous with head and thorax. Fore tarsus with a short, stout, triangular tooth.

Abdomen stout, heavy, about twice as wide as pterothorax; tube yellow, less than half as long as head, distinctly constricted at apex, which is black; all abdominal bristles colorless, mostly knobbed.

Measurements of holotype (approximate only): Length 2.58 mm.; head, length 0.49 mm., width 0.32 mm.; prothorax, length 0.25 mm., width (inclusive of coxæ) 0.43 mm.; pterothorax, width 0.30 mm.; abdomen, width 0.56 mm.; tube, length 0.22 mm., width at base 0.093 mm., at apex 0.052 mm.

Antennal segments	1	2	3	4	5	6	7	8
Length (μ)	75	81	150	108	96	87	63	51
Width (μ)	54	39	43	44	42	40	30	18

Total length of antenna, 0.71 mm.

Described from one female taken on Bermuda grass at Dallas, Texas, July 21, 1908, by Dr. W. A. Hooker. The species is named in his honor in recognition of his interest and economic work in this order of insects.

This is one of the most aberrant American thrips, possessing unique characters of structure and coloration. In some ways it suggests *Compsothrips albosignatus* Reuter, which occurs in the Mediterranean province of the Palearctic region.

Explanation of Plate 8.

Fig. 1. *Œdaleothrips hookeri* gen. et sp. nov., right fore tarsus, lower surface.

Fig. 2. *Œdaleothrips hookeri,* tube, dorsal surface.

Fig. 3. *Œdaleothrips hookeri,* right antenna, inner dorso-lateral surface.

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* Proc. Biol. Soc. Wash., Vol. XXVII, 1914, Pl. V, Fig. 4.

A COMPARISON OF THE PUPAE OF PROMACHUS VERTEBRATUS AND P. FITCHII (DIPTERA).

By J. R. Malloch, Urbana, Ill.

In a recently published paper I presented, along with descriptions of a number of pupæ of Asilidæ, a synoptic key that I thought might prove useful to other students in separating certain pupæ of this family. As it was based upon a very small number of species I considered it highly probable that species belonging to genera unrepresented in my material would run out of the key either because of their lack of characters found in species in the caption to which they seemed to run or because of their disagreement with the descriptions of the species in the text to which they seemed to be allocated by the use of the key. It is therefore highly gratifying to discover that in cases where I have been able to obtain species belonging to the genera dealt with in my previous paper* they invariably are readily assigned to their proper genera by the test of the characters used in the key.

I used as the character for the separation of *Promachus* from other genera the structure of the thoracic spiracles, which in this genus are mere rugose callosities or slight irregular elevations, whereas in the other genera known to me there are invariably distinct, reniform, elevated areas such as are present on the spiracles of the abdomen. I had a large series of specimens of *vertebratus* and considered the structure of the thoracic spiracles constant. I have now obtained from Dr. E. P. Felt examples of pupæ of *fitchii* which agree with those of *vertebratus* in having no reniform elevation. I present herewith a summary of the characters that distinguish the pupæ of the two species before me.

It is necessary to indicate that there is a difference in the pupæ of the sexes in both species as to the form of the apical abdominal segments, which fact is not mentioned in my previous paper. The eighth ventral segment in the female is unarmed in both species, as will be seen by referring to Fig. 2, Plate LXXXII, of my paper, while in the male of both it is armed with spines. The apical segment in the female is noticeably shorter

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* Bull. Ill. State Lab. Nat. Hist., Vol. XI, Art. 4, 1915.

than in the male, especially in *fitchii,* which species has a very large hypopygium, the males have also 2 small, round, raised areas transversely situated near the middle of last segment.

In both species of *Promachus* I find, in addition to the spiracles, 2 very distictly elevated rugose areas on the anterior margin of the mesothorax, one on each side of the dorso-median line. In other Asilidæ which I have examined the corresponding areas are not appreciably distinguished either by elevation or rugosity.

The following diagnosis will serve to separate *fitchii* and *vertebratus,* and should be used at caption 9 in my key to the species in the paper already mentioned.

Lateral cephalic process consisting of 3 simple thorns, the upper one strongest; the last 5–8 thorns on lateral extremities of transverse armature of abdominal segments 2–7 stout, flattened, and rather wedge-shaped, their bases fused so that the whole appears as a flap-like process with a deeply serrate posterior margin; eighth ventral abdominal segment of male with 2 thorns; average length 25 mm. *vertebratus.*

Lateral cephalic process consisting of 3 thorns, the upper one bifid or sometimes duplicated, so that the process appears quadrispinose, the middle thorn generally strongest; the last 5–6 thorns on lateral extremities of transverse armature of abdominal segments 2–7 very slender, their bases distinctly swollen but not fused; eighth ventral abdominal segment of male with 4 thorns; average length 21 mm. *fitchii.*

In addition to the above, *fitchii* differs from *vertebratus* as follows: the upper cephalic thorns are shorter and stouter and the distance between them is greater, at apices exceeding the length of a thorn, whereas in *vertebratus* it is distinctly less than the same; the wart-like protuberance on wing in longitudinal line with the abdominal spiracles is small, rugose, and without an outstanding sharp ridge, while in *vertebratus* it is rather large and has a sharp ridge which is directed slightly upward; the abdominal armature is weaker, especially on lateral areas, where it is not, as in *vertebratus,* noticeably stronger than the armature of the post-spiracular area; the transverse armature of the seventh dorsal segment consists of long thorns only, the small ones that occur between these in *vertebratus* being absent; the apical armature consists of an upwardly directed thorn, much shorter and broader than that in *vertebratus,* and a very small one at its base.

In other respects the species agree closely. The male of *fitchii* which is before me differs from that of *vertebratus,* and also from the female of *fitchii,* in that the wings fall slightly short of the apices of the fore tarsi instead of extending a little beyond them; this may be a variable character and I do not make use of it owing to lack of material for comparison.

I have seen the pupa of another species of *Promachus,* to which I have been unable to assign a species name. It agrees with *vertebratus* in the structure of the lateral cephalic process in having the upper thorn simple, but the upper cephalic thorns are similar to those of *fitchii,* and the lateral process has the thorns shorter than in *vertebratus.* As in the other two species there are only 3 postspiracular thorns on the first abdominal segment; the transverse dorsal armature is very similar to that of *fitchii* in as far as the lateral areas are concerned, but there are no short thorns between the long ones on the seventh dorsal segment, and the apical segment has the upper pair of thorns much swollen at base and ending in rather long sharp points, while the 2 small thorns are stronger and the ventral posterior margin has also 2 small thorns. The length of this species is 14 mm.

Vertebratus and *fitchii* are predaceous on white-grubs, *Phyllophaga* (=*Lachnosterna*) spp., the larval habits of the unidentified species are unknown to me.

I take this opportunity of intimating that the pupa which I described under the name *Promachus milberti* in the paper previously referred to, is correctly identified. I had some doubt about the identity when I wrote the paper as the exuvia were not connected with reared imagines; but since the paper appeared I have had the opportunity of examining a reared specimen which confirms my tentative identification.

OPEROPHTERA (RACHELA) BRUCEATA HULST.

By Richard F. Pearsall, Allaben, N. Y.

In Entomologica Americana, Vol. VI, pp. 123–24, Dr. Geo. D. Hulst describes this species. He says: "The female of this species (I have several before me) is almost entirely wingless.

It has just the merest rudiments of wings—and from its color and size, I have no doubt it has, if taken, been looked upon as the ♀ of one of the species of *Anisopteryx* (=*Paleacrita, Alsophila*). It is of a grayish black color. Antennæ and legs annulated with white. Thorax and abdomen marked above more or less with blackish."

This description is at variance with two specimens which I secured in the Catskill Mts. in early winter, November 26 and 27, 1915. There had been a fall of snow eighteen inches deep some days before, but it had melted rapidly and these examples were taken walking up the trunks of maples, one in the early morning, the other at dusk. The males had been rather plentiful some ten days previous.

Dr. Hulst was prone to mix his species, and his description above quoted applies apparently to an example of the so-called *Anisopteryx* among the several before him, and for this reason I append the following:

♀. Length 23–25 mm. Form slender. Palpi slender, porrect. Tongue rudimentary. Antennæ long and fine. Frons broad, slightly bulging. Eyes large. Legs rather long. Hind femora a little heavier and twisted, with all spurs. Vestiture smooth. Color a faded seal brown inclining to yellowish, with a sprinkling of ashen white scales. Antennæ brown above, white beneath. Front and thorax above brown; beneath more heavily ashen. Tip of abdomen white. Abdomen above with ashen scales, mixed rather freely with brown, leaving a dorsal patch of clear brown on the first segment of the abdomen, with decreasingly smaller ones on the next three or four segments following. Legs and tarsi brown, with their inner surfaces ashen. Wing pads very small, brown tipped with ashen.

It will be observed that the legs and antennæ are not annulate with white and the colors differ from the original description.

The specimens above described are in the collection of the American Museum of Natural History in New York. If my notes are correct, the original type specimens are not in existence.

TWO NEW LUCANIDS FROM NORTH AMERICA.

By John. W. Angell, N. Y. City.

Lucanus elaphus var. nov. **carlengi:** Similar in color and surface texture to typical form but differs in the following characters: Head flatter and narrower, width between the eyes about equal to thorax, frontal ridge straight or very slightly arcuate, occipital crest much less developed, mandibles less arcuate and but slightly bent downward, terminal teeth very unequal, the inner being reduced to a small spine, middle tooth much less developed, length 38–43 mm. Louisville, Ky., and northern Illinois. Described from two males received from Mr. Chas. Schaeffer. This interesting variety, which I have named in honor of my friend, Charles W. Leng, can be distinguished at once by its flattened form when viewed from the side, the mandibles, body, thorax and elytra forming practically one plane.

Dorcus parallelus var. nov. **carnochani:** Differs from the typical form in the following characters: Elytra much smoother, showing only faint striæ; body much flatter and broader; width of head (also thorax) much greater than width of elytra; eyes less prominent; anterior tarsi more slender; mandibles much more arcuate and blunter, the two teeth being almost equal.

This variety, which I have named in honor of my friend, Mr. F. G. Carnochan, is readily distinguishable by its broader body and smoother sculpture and would appear to be related to the form known as *D. brevis* Say.

Described from two males and one female, taken at New City, N. Y., by F. G. Carnochan and in my collection. Length (♂♂) 22–21 mm.; ♀ 20 mm.

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BULLETIN
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SUPPLEMENTARY NOTES AND DESCRIPTIONS OF NORTH AMERICAN OSTOMIDÆ, CLERIDÆ, AND COSSONUS (COL.).

By Edwin C. Van Dyke, Berkeley, Cal.

The following notes and descriptions are in the nature of an appendix to two previous articles, one on certain Ostomidæ* and the other on the genus *Cossonus*.† They are the result of additional material and data combined with a renewed study of certain of the forms. The chief source from which I received this material was the U. S. National Museum, through the kindness of Dr. E. A. Schwarz and Mr. H. S. Barber. Dr. Schwarz also furnished me certain notes upon some of the early descriptions which I was not able to see, as well as some notes based upon his own studies.

Nemosoma punctatum n. sp. Form narrow, elongated, cylindrical, moderately shining, black with basal one third of elytra and antennæ rufous, the basal spot not extending quite to elytral margins. Antennæ extending backwards to thorax, first joint moderate in size, joints 2–8 small and short, gradually increasing in size outwardly and together subequal in length to club; club robust and over twice as wide as eighth joint. Head elongate, about one and a half times as long as wide, with sides posterior to eyes parallel or just perceptibly arcuate, head broadest across eyes where of about equal width to elytra; eyes moderate in size and prominence and placed about at middle of head; epistoma deeply triangularly emarginate and impressed, front with a longitudinal impressed line; surface rather coarsely and regularly punctured, the punctures at least their own width apart. Prothorax subequal in length to head, narrower posteriorly than elytra, gradually divergent forwards two thirds of way to head, thence parallel, at apex as broad as base of head and but slightly less than width of elytra, disc evenly convex, punctured similarly to head, side margin fine. Elytra about two and a half times as long as wide and somewhat longer than head and thorax together, punctured similarly to head and thorax, without tendency to serial arrangement, disc without trace of striæ, a short rather deep linear impression without suture on apical depression. Head and prothorax beneath coarsely and sparsely punctured, gula transversely wrinkled, metasternum and abdomen sparsely and finely punctured.

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* "Some New Beetles in the Families Ostomidæ (Trogositidæ) and Cleridæ from California," by Edwin C. Van Dyke, Bull. Brooklyn Ent. Soc., Vol. X, No. 2, pp. 25–33.

† "The Species of *Cossonus* Clairv. (Coleoptera) of America North of Mexico," by Edwin C. Van Dyke, Bull. Brooklyn Ent. Soc., Vol. X, No. 1, pp. 1–23.

Length 4.5 mm., breadth 1 mm.

Type: A female in my own collection.

The description is based upon a single specimen collected at Ashland, Oregon, May 5, 1915, by Mr. G. H. Champion and kindly presented by him. One other specimen which is undoubtedly the same species has been seen and compared. This latter was collected on cedar, *Libocedrus decurrens* Torr., in the burrows of a species of *Phlœosinus,* on the Klamath river near Hamburg, Siskiyou County, California, March 15, 1916, by Mr. Ralph Hopping. It is of the same size, shape and color as the type, but differs in a few minor ways, such as having the two projecting portions of the epistoma more prolonged and slightly everted at the apex and in having the punctuation of the thorax somewhat finer and that of the elytra much finer, especially toward the apex. The epistomal character is no doubt sexual, this specimen being a male.

This species in size and general shape simulates *N. fissiceps* Fall, but it differs from that not only in having a black prothorax but in being definitely and generally punctured. It simulates *N. attenuatum* Van Dyke in regard to color, but differs in being much more robust and in being decidedly punctured. It should appear in my table between *fissiceps* Fall and *attenuatum* Van Dyke.

Grynocharis expansa n. sp. Form elliptical, depressed, moderately shining, rufous, with sparse clothing of short, depressed, yellow hair. Antennæ reaching backwards about to middle of thorax, first joint moderate in size, bulbous, and with outer anterior part angular, second smaller and almost globular, third still smaller, but longer than broad, the fourth as broad as long, the remainder broader than long, joints three to eight gradually increasing in breadth, the ninth, tenth and eleventh suddenly enlarged and forming a loosely jointed club. Head broader than long, one half breadth of thorax, coarsely variolately punctured, front flattened, eyes moderate in size but distinctly smaller than in *G. pilosula* Cr. Thorax twice as wide as long, disc moderately convex and finely sparsely punctured, sides depressed, widely explanate, the expanded portions together over one third the breadth of thorax and with punctuation coarse and closer than on disc, basal margin with median half slightly lobed, the outer parts just perceptibly rounded, hind angles well rounded, side margin evenly and gradually arcuate, finely serrulate, and somewhat convergent to anterior angles which are well rounded, anterior margin deeply and semicircularly emarginate. Elytra with breadth two thirds of length, about three times as long as thorax, breadth at base the same as breadth of thorax, thence gradually increasing to posterior two thirds, disc quite flat, sides suddenly depressed below disc and explanate, the expanded margin almost as wide as in the thorax, surface moderately coarsely and sparsely punctured, each puncture with a short, yellow procumbent hair arising from it, side margins very finely serrulate, apical angles slightly and individually rounded. Beneath very finely and sparsely punctured and finely and sparsely pubescent.

Length 5 mm., breadth 2.25 mm.

Type: A unique in my own collection.

My specimen I owe to the kindness of Mr. J. C. Bridwell, who collected it on Mt. San Jacinto in Southern California, in July, 1912. Two other specimens have been seen, a male and female, a pair in the collection of Mr. Ralph Hopping. They were collected from beneath the bark of cedar, *Libocedrus decurrens* Torr. at Cascada, Sierra National Forest, Fresno County, California, June 1, 1915. Both have the head and abdomen somewhat piceous, darker than in type, and the female has the punctuation of elytra somewhat coarser than in the male and than in my specimen, which is also a male, otherwise they are the same. The male is 5 mm. in length and the female 6 mm. It is interesting to note that this pair were taken from beneath dead bark where both *G. quadrilineata* Melsh, and *G. oregonensis* Cr. are to be found, while *G. pilosula* Cr., though very common, has always been taken in flowers, chiefly those of *Ceanothus,* the so-called wild lilac.

This species in size and general appearance is like *G. pilosula*

Cr. and might at first be taken for a badly rubbed specimen of the same. It, however, differs markedly as regards a number of features, such as in its greater flatness, having only one half the dorso-ventral diameter of the other; its much more greatly developed thoracic and elytral margins, the elytral margin in this species being wide as in the thorax, while in the common species, it is quite narrow; in having the anterior margin of the thorax rather deeply emarginate in contrast to the straight margin of the other; in being much less densely and coarsely punctured, especially as regards the elytra, the punctuation in *G. pilosula* Cr. being very coarse and dense; in having a very fine, sparse, and hardly perceptible pubescence as against a rather dense and conspicuous one; and in having differences in antennal structure such as broader and shorter intermediate joints in contrast to the narrower and more elongate ones in the other species.

Galeruclerus trilobatus Van Dyke. Certain intermediate phases of the above, which have recently been seen, have convinced me that this is no more than a variety of *G. fasciata* Lec., so it must accordingly be reduced to its proper status.

The new species of *Cossonus* described in the following pages will make necessary certain changes in my table for the separation of the species. These will be as follows: Just in front of *subareatus* Boh. and including it, change the table to read:

Basal portion of rostrum longer than dilated portion.
  Neck of rostrum decidedly longer than apex, dilated portion as long as broad .... *subareatus* Boh.
  Neck of rostrum barely longer than apex, dilated portion transverse. *pacificus* n. sp.

After *texanus* n. sp. add

Head with prominent eyes, projecting beyond border, rostrum convex and depressed apically, a fovea on both vertex and rostrum..*schwarzi* n. sp.

and after *concinnus* Boh. add the following sentences, the first of which should be of equal standing with that following *concinnus:*

Rostrum with apical portion just perceptibly wider than basal. Thorax narrower than elytra.
  Rostrum elongate, thorax and elytra very coarsely and densely cribrately punctate .... *hubbardi* Schwarz.
  Rostrum short, thorax with deep triangular depression in median portion, the discal boundaries almost smooth .... *fossicollis* n. sp.

Cossonus pacificus n. sp. Black, shining. Head quite smooth except for a few fine and sparsely placed punctures, rostrum moderately coarsely and closely punctured at sides and rather finely and sparsely above. Eyes moderate and but very slightly protruding beyond sides of head, diameter of head across eyes slightly greater than dilated portion of rostrum. Sides of head gradually convergent forwards, slightly constricted in front of eyes to rostrum, a small fovea at middle of vertex. Rostrum as long as one half of the thorax and but slightly arcuate, basal portion barely longer than apical, narrowest a short distance in front of eyes, then gradually increasing in width to apical portion which is one third broader than narrowest portion, quadrangularly dilated and slightly broader than long. Joints of funicle of antennæ very slightly increasing in width outwards, the outermost joint about one half the width of the club.

Prothorax slightly longer than broad, base bisinuate, sides from slightly constricted base, gradually arcuate to anterior third, then more suddenly rounded to slightly constricted apex, surface flattened, unequally punctured, the punctures along sides of median smooth line, coarse and sparsely placed, very fine and sparse on outer part of disc and moderately coarse and more closely placed at sides. At the base the longitudinal line becomes somewhat cristate.

Elytra distinctly wider than thorax, with disc somewhat flattened, striate, striæ rather coarsely, evenly, and serrately punctured, intervals convex, particularly posteriorly, very minutely uniseriately punctured.

Body beneath moderately coarsely and closely punctured anteriorly and more finely and sparsely punctured posteriorly.

Length 7 mm., width 1.75 mm.

Type: In my own collection; paratypes in U. S. Nat. Mus. and Cal. Acad. of Sciences, all from Tallac, Lake Tahoe, Cal., June, 1899, and taken by myself from beneath bark of dead aspen, *Populus tremuloides* Michx.

This species is the one which I considered, in my previous paper, as the western phase of *C. subareatus* Boh. and which I now, after a more thorough and renewed examination, feel must be considered as distinct. All my previous notes referring to western localities for *C. subareatus* Boh. must therefore be considered as applicable to this species. A giant form from Fieldbrook, California, collected by H. S. Barber, and now in the Nat. Mus. Coll., I must at present consider as nothing but a very large female of this species. This species differs from the true *C. subareatus* Boh. in being generally broader and flatter, the other being quite cylindrical; in having the elytra much more coarsely punctured and with more convex intervals; the undersurface also more coarsely punctured; and in having the basal portion of the rostrum barely longer than the apical and less parallel and with the apical dilatation somewhat transverse, whereas the basal portion in the other is decidedly longer than the apical, almost parallel near the eyes, and the apical portion not broader than long.

C. schwarzi n. sp. Black, shining. Head finely and sparsely punctured posteriorly, rather coarsely and closely between eyes and on rostrum. Sides of head posterior to eyes slightly arcuate, eyes prominent and projecting convexly well beyond sides of head, causing head to become suddenly constricted to base of rostrum. Vertex with a moderately deep and elongate puncture, diameter of head across eyes slightly less than greatest breadth of rostrum. Rostrum about half the length of the thorax, rather suddenly depressed at apex, basal portion about equal in length to apical, about as broad as long and with straight and parallel sides, apical portion abruptly and quadrilaterally dilated, broader than long and at least one third broader than basal portion, a small elongate puncture at middle of dorsal surface and in line with the deeper one of the vertex. Joints of funicle of antennæ gradually increasing in width outwards, the outermost joint about a third wider than first and one half the width of club.

Prothorax slightly longer than broad, base bisinuate, sides from slightly constricted base, gradually arcuate and convergent until near apex where slightly constricted. Surface somewhat flattened above, with moderately coarse and well separated punctures, coarser and closer at sides, a median smooth line outlined by a margin of coarser punctures than usual, particularly at base.

Elytra distinctly wider than thorax, slightly convex but with disc slightly flattened, deeply striate, coarsely punctured, punctures somewhat deeper and coarser at base, intervals slightly convex, very minutely uniseriately punctured.

Body beneath, sparsely and finely punctured in sternal area of thorax, coarsely at sides, especially of prothorax, rather moderately and more evenly punctured over abdomen.

Length 5 mm., breadth 1.3 mm.

Type and two paratypes in U. S. Nat. Mus., paratype in my own collection, all from Williams, Arizona, and from the Saltau collection of the U. S. Nat. Mus.

This species, which I take great pleasure in naming after my good friend, Dr. E. A. Schwarz, would come in my table, closest to *texanus*. It differs from that chiefly in having the eyes more prominent, the rostrum convex on top and with a median puncture which is in line with a similar one on the vertex, and in having the apical part of the rostrum more depressed. Superficially it suggests a small *piniphilus* but it lacks the cuneiform thorax and besides has a different type of head and rostrum. The presence of fovea on both vertex and rostrum and the apically depressed rostrum should prevent this species from being confused with any other in our fauna.

C. hubbardi Schwarz. Psyche, Supplement to, I, May, 1899. Black, but slightly shining. Head smooth back of eyes, coarsely punctured from hind margin of eyes forward to middle of basal portion of rostrum, thence smooth and sparsely finely punctured. Front with a deep oblong fovea extending to the anterior part of the vertex. Eyes moderate in size and barely protruding beyond the straight and oblique sides of head, diameter of head across eyes about one third greater than dilated portion of rostrum. Rostrum slightly longer than one half of thorax, arcuate, basal portion just perceptibly shorter than apical portion, cylindrical and with sides just divergent anteriorly, apical portion feebly dilated and quadrilateral. Antennæ inserted at outer fifth of beak, scape extending slightly beyond the hind margins of the eyes, first funicular joint about twice as long as wide; second point slightly longer than wide, obconical, joints 3–7 transverse, gradually but not strongly increasing in width, club large, over twice as broad as outermost joint of funicle, oblong-oval, opaque, pubescent, basal portion very little smoother than the apical portion.

Prothorax very little longer than broad, with sides straight and slightly diverging from base to three fourths of length, then evenly rounded to near apex where but slightly constricted, base bisinuate. Surface somewhat flattened, extremely coarsely, densely cribrato-punctate, the interstices broader and more shining on the disc than on the sides, a distinct depression anterior to the scutellum where a shining cribriform elevation may be seen, and on front of this a large equally shining rudiment of a smooth median line.

Elytra at base considerably wider than thorax, striate, the striæ extremely coarsely punctate, intervals narrow, subcostiform, sutural interstices with row of fine punctures and depressed behind the scutellum.

Body beneath very coarsely and densely punctate, the mesosternum and abdomen less densely than the prosternum. Front tibia not sinuate at inner edge.

Length 3.7–4.8 mm., breadth 1.5 mm.

This very distinct species which is related to none of our other species, was unfortunately overlooked when I reviewed the genus. I have therefore introduced it here in order to have all of our species listed together. The description given is based upon the original but modified to conform with my others. A specimen very kindly loaned by Dr. Schwarz has enabled me to study it in detail.

As stated in the original account, this species was collected by the late H. G. Hubbard, at Tucson, Arizona, and taken from the dead tissues of a wounded giant cactus, *Cereus giganteus*. A specimen from Lower California, in the collection of Mr. H. C. Fall, has been referred by him to this species.

Cossonus fossicollis n. sp. Black, shining. Head practically impunctate posteriorly, very finely and sparsely punctate on dorsal surface of rostrum, more coarsely and closely at sides. Head, including eyes, cuneiform, and gradually convergent to rostrum, the eyes rather flat and just projecting beyond sides of head, an elliptical shaped fovea on vertex between eyes, the diameter of head across eyes a little less than one third greater than dilated portion of rostrum. Rostrum distinctly less than one half length of thorax, arcuate, basal portion about equal to apical, moderately broad and with parallel sides, apical portion just perceptibly wider than basal portion. Joints of funicle of antennæ transverse and but very gradually increasing in width outwards, the outermost joint distinctly less than one half width of club.

Prothorax distinctly longer than wide, base bisinuate, sides at middle two thirds almost parallel, gradually obliquely convergent posteriorly, gradually rounded anteriorly to constricted anterior portion, surface flattened above, with deep longitudinal triangular depression extending from its apex near the anterior margin to the base where it occupies over one third of total breadth; through the middle of this depression there runs a linear slightly elevated line that is bounded anteriorly by a single row of deep punctures and posteriorly by a confused series of similar punctures, the disc outside of the depression but very minutely and sparsely punctured and quite shining, the sides of thorax moderately coarsely and closely punctured.

Elytra distinctly wider than thorax, slightly convex above, deeply striate, coarsely punctured but with punctures well separated even anteriorly, where they are coarser and deeper, intervals slightly convex and with punctures practically imperceptible.

Body beneath coarsely and closely punctured on prothorax and sides of mesothorax and anterior segments of abdomen, and rather finely and sparsely on mesosternum and median and posterior part of abdomen.

Length 3.5 mm., breadth 1 mm.

Type: A unique from the Santa Rita Mountains of Arizona, collected May 25, from the Hubbard and Schwarz collection, and now in the U. S. Nat. Mus. by whom it was submitted for study and description.

This very distinct species, because of the peculiarities of its thorax, should be confused with no other species in our fauna. In my table, it should follow *C. hubbardi* Schwarz, the two in their turn to follow *C. concinnus* Boh. It is, however, not closely related to either.

C. bohemanni Horn. This should be placed as a synonym of *C. platalea* Say. As stated by Dr. E. A. Schwarz, Bohemann used the term "pone" for "near" and not "behind" as interpreted by Dr. Horn.

C. quadricollis Van Dyke. Two specimens from the Nat. Mus., collected at Republic, Oregon, by Mr. A. W. Barber, have been seen. This shows the northward distribution of the species, as was to be expected.

C. ellipticollis Van Dyke. Six specimens from Arizona, mostly Winslow, belonging to the Nat. Mus., have been seen.

C. concinnus Boh. This should be reduced to a variety of *C. impressifrons* Boh. A review of the literature has convinced me that there is no valid reason for retaining it apart.

C. crenatus Horn. Specimens of this species have been taken in abundance in various parts of California, from the so-called digger pine, *Pinus sabiniana* Dougl.

NOTES ON STRATEGUS MORMON.

By Warren Knaus, McPherson, Kan.

The writer first took this rare Scarabæid June, 1913, on ground he had collected over at least once a season for almost a quarter of a century. The two specimens were male and female from burrows under horse droppings. The burrows are easily distinguishable, being about 1¾ inches in diameter, larger by a fourth than the similar holes of *Phanæus difformis* in the same situation. Usually a pile of freshly turned sand at horse droppings indicates a burrow, the larger *Strategus mormon,* the smaller the *Phanæus;* but occasionally there is no sand heap or covering around the larger. The hole either goes straight down or inclines not over fifteen degrees and varies from four to twelve inches in depth. My first two *Strategus* was taken on a perfectly bare sand dune, probably fifty yards apart.

In 1915 I secured eight specimens on the dunes under horse droppings a mile away from the locality of my first specimens. They were five males and three females, coming from late in

May to early July. At one pile of droppings the fresh sand had been thrown up and a lateral burrow extended west from the pile for about fifteen inches. By running my finger under the ridge I encountered a male, which apparently had come upward from association with the female and, reaching the horse droppings, was tunneling out. The female was in the burrow about ten inches below the surface. About ten feet away another male was taken from his burrow. Still another was found about two hundred yards away from the first, at the bottom of an eight inch hole, the entrance of which was at least six inches away from the droppings.

June 16, 1916, a visit to the same locality (near Medora, Kansas) resulted in the capture of another pair on the same dune where I took my first specimens. One was located under horse droppings evidently three or four weeks old, almost covered by drifting sand. This was a male. Between four and six inches under the surface there was a mass of dung 1¼ to 1½ inches in diameter and several inches long. In it were found seven eggs, two to three mm. in diameter, almost pearly white. Twenty feet away another pile, partly sand covered, revealed another burrow. In this at the bottom, about ten inches down, was a female. Six inches under the surface there was a similar mass of dung. It is evident that the species prefers droppings from one to three weeks old, while fresher ones are chosen by *Phanæus difformis*. Thus the masses for egg deposit are much drier and less compact for the former than the latter. *Phanæus* will also use cow droppings, under which I have never found *Strategus*. All the specimens I have taken were alive and perfect.

By the fortunate finding of two additional specimens of *Strategus mormon* in the sand hill region near Medora, Kansas, July 2, the total catch of this insect for 1916 was increased to four specimens—two pairs.

The first specimen was found about three miles east of the locality where the other specimens of this species have been collected. The specimen was a female, and was found dead under cattle chips. The insect had only recently died, as it was relaxed and in good condition. Under the droppings was the mass of fæces in which the female deposits her eggs. The fragments of another *Strategus* was also found a half mile west. The other specimen taken was found in the locality where all the specimens heretofore have been taken. It was a male and was dead under a pile of horse droppings. It too had only recently died, as it was relaxed and in fine condition.

The findings of these two specimens dead indicated that the season was over and this was further shown by the fact that no other specimen was found nor any of their characteristic holes in the sand observed.

It is interesting to note the sequence of insect life as represented by the Coleoptera in this sand hill region. I collected on four dates of the ordinary spring collecting season, the result showing partially as follows: May 7, 19 *Cicindela scutellaris,* 15 *C. formosa,* 9 *C. tranquebarica,* 12 *C. repanda,* 1 *C. hirticollis,* 1 *Geopinus fluvialis,* Casey, 1 *Chlaenius pennsylvanicus,* 1 *Selenophorus* sp., 5 *Sphaeridium scarabeoides,* 1 *Saprinus* sp., 1 *Canthon praticola,* 1 *Phaneus difformis,* 3 *Onthophagus guatemaliensis,* 3 *Geotrupes opacus,* 8 *Ligyrus relictus,* 1 *Cremastochilus nitens.*

On June 16 these were taken: 25 *C. formosa,* 6 *C. scutellaris,* 1 *C. lengii,* 3 *C. repanda,* 11 *Phaeneus difformis,* 3 *Tetraopes canescens,* 1 *Sphenophorus destructor.*

On June 25 these Cicindelidæ were taken: 6 *C. formosa,* 1 *C. tranquebarica,* 6 *C. cuprascens,* 4 *macra,* 31 *C. hirticollis,* including several of the variety *ponderosa,* and 73 *C. lepida.* Of the 73 *C. lepida,* 3 had green thorax and head. All the rest were bronzed.

On July 2 the following were taken: 28 *Cicindela lepida,* including one with a green head and thorax; 11 *Phaneus difformis* of which most of the males had fully developed horns. This was also characteristic of the males of this species taken June 16.

Cicindela lepida occurred on perfectly bare white sand, back a considerable distance from the pools of water. *Cicindela hirticollis, cuprascens* and *macra* occurred along the water's edge and back fifteen or twenty feet. The *lepida* were good runners, but were not strong fliers and a collector could stand at one place and take a half dozen or more by successive sweeps of the net. They preferred the sheltered sides of sand dunes and appeared usually about nine o'clock in the morning, becoming more active as the sand became heated.

A NEW PENTATOMID.

By Chris. E. Olsen, Maspeth, L. I., N. Y.

Podisus fretus n. sp.

Large and broad, ranging from 12.5 mm. to 14.1 mm. in length, 6.75 mm. to 7 mm. in width (across humeri); profusely marked with red and reddish-brown spots and blotches (with a variable amount of purplish tinge in them), especially on venter and hemelytra; humerus rounded and without spine; median ventral spine long.

Head: lateral margins of cheeks nearly parallel, slightly widening before the eyes and rounding apically; apical margin rarely convex; cheeks as long as tylus, sometimes a trifle longer; widest part of head (not including eyes) 1.65 mm.; width across the eyes 2.8 mm.; lateral anterior margins dark, at times becoming quite black. Antennæ—color general dark reddish-brown throughout, covered with pale hairs, on first joint hairs are shorter and more scattered than on the following joints. Rostrum ferruginous except apical joint, which is very dark red-brown. Pronotum, anterior-lateral margin forming a straight line from behind the eyes to the humeral angles, but for a slight bend two fifths of the way from the humerals; a slight indication of a pale anterior-lateral margin, but here and there the dark color will touch the edge; dentations large, coarse and irregular; humeral angles obtusely rounded and without spine. Scutellum brown, punctures dark brown, mingled with dark red, diminishing in size towards apex; in some specimens the punctures are very sparse apically, giving the appearance of a pale apex, in other specimens the apex is well covered with punctures; hemelytra red-brown, punctures dark brown, the embolium and posterior section of corium well marked with red blotches in most of the specimens. Membrane yellowish brown, translucent, with a smoky elongate spot in the apical angle. Venter yellowish brown, with numerous dark brown and dark red irregular spots and blotches; on the sternum there is a tendency to form some sharp lines along the larger blotches, especially along the anterior-lateral edge; here this edge is pale almost to the humeral angles; ventral row of median spots are large, dull and dark red-brown, the edge of which is not sharply defined, but rather fading out; two similar rows of spots occur on the venter, one on either side about midway between median one and connexivum at upper abdominal segments and gradually diminishing and drawing closer to the median row; the spot in the median row on segment just before genitalia is obviously larger than preceding spots; there is still another row of dark brown blotches along the spiracular line; these are quite different from the former rows and consist for the most part in dark-colored punctures grouped in irregular blotches; venter well marked with dark brown dots; in some specimens they are quite red;

median ventral spine long and pale; connexivum with large black maculations at joints; femora unicolorous yellow-brown to dark brown in some, with punctures red-brown to nearly black; tibiæ unicolorous, reddish brown; tarsi reddish, mostly lighter than tibiæ and more reddish, but in some cases darker.

Described from ten specimens collected as follows: Type (male), Rockaway Beach, IV 17, 1912, by Alan S. Nicolay (Olsen Coll.); allotype (female), Rockaway Beach, V 17, 1910, by C. E. Olsen (Olsen Coll).; paratypes (males), Amherst, Mass., V 16, 1910, and Amagansett, L. I., by G. P. Engelhardt (Bueno Coll.); Wyandanch, L. I., VIII 30, 1914, by F. M. Schott (Olsen Coll.); paratypes (females), Promised Land, L. I., IX 24, 1910, and Wilmington, N. C., IV 16, 1916, by W. T. Davis (Barber, Coll.); Yaphank, L. I., IX 25, 1911, by J. R. de la Torre-Bueno (Bueno Coll.); Wyandanch, L. I., VIII 30, 1914, by F. M. Schott (Schott Coll.); New Brunswick, N. J., V 18 (Amer. Mus. Nat. Hist. Coll.). Mr. Bueno's specimens from Amherst, Mass., and Yaphank, L. I., were both beaten from pine, whereas Mr. Schott's specimens were taken beating oak; the writer has taken two specimens in washup on Rockaway Beach, one of which is in Mr. H. G. Barber's collection (not mentioned as type).

This species is readily distinguished from *P. maculiventris* by the broader and proportionally shorter anterior part of head (from in front of eyes); by its straighter anterior-lateral margins of pronotum on which the pale band along edge is not so decided, in some specimens almost obsolete; by the rounded humeri and lack of humeral spine; by median ventral spots being large, dull red-brown and not sharply defined when present, but never shining black; by the venter being profusely marked with red and red-brown spots and blotches; by the larger size, more robust appearance and general color being darker and more reddish dorsally and much darker and redder ventrally. From *P. serieventris* it is distinguished by its much larger size, long median ventral spine, absence of darker subapical annulus on the femora, more reddish color especially ventrally, by the median row of ventral spots being large dull red-brown and not sharply defined.

The author wishes to acknowledge with thanks the valuable assistance rendered by Messrs. H. G. Barber, J. R. de la Torre Bueno and other collectors in turning over their material for study.

A KANSAS VARIETY OF EUPHORIA HERBACEA.

By Warren Knaus, McPherson, Kan.

Through the courtesy of Prof. S. J. Hunter, entomologist of the State University, Lawrence, Kan., I have examined a male and female *Euphoria* (*Erirhipis*) taken for the first time in this State. The female is labeled "Crawford Co." and the male "Cherokee Co." Both were taken by the summer collecting party sent out by the University July and August, 1915.

A comparison of the pair with eastern specimens of *E. herbacea* Oliv. from Maryland, Virginia, Pennsylvania, and Staten Island, N. Y., shows the Kansas specimens much larger, more robust, less marked on elytra with tomentose spots, and elytral costæ much less prominent. The Crawford Co. female measures: long. 16 mm., lat. 10; the male 15 by 9. The color of each is dark olive, with a reddish cast on elytra.

If these specimens are worthy of a varietal name, I suggest *Erirhipis* (*Euphoria*) *herbacea* var. *occidentalis* var. nov. The pair are in the State University collection at Lawrence, Kan.

THE MOTH AND THE FLAME.

From the Persian of Azz' Eddin Emocalessi, about 1100 A.D.

Each tortured moth that flutters 'round the candle flame
Is constant, tho' with singed wings and bitter pain.
"Love cannot die," it whispers, "can I love thee less,
Tho' loving thee brings naught to me than certain death?"

R. P. D.

THE BEE AND THE BLOSSOM.

From the Persian of Azz' Eddin Emocalessi, about 1100 A.D.

The honey dew from every flower
To Mistress Bee is marriage dower;
But, unlike woman, her sweet kiss
Ne'er injures him who gives her bliss.

R. P. D.

THE PRESENT STATUS OF THE CANKER WORMS ALSOPHILA POMETARIA AND PALEACRITA VERNATA IN BROOKLYN.

By Geo. P. Engelhardt, Brooklyn, N. Y.

Brooklynites with recollection reaching back to the sixties may recall the annual defoliation of their shade trees together with the annoyance to pedestrians in brushing against innumerable small "worms" suspended by delicate silken threads from branches and twigs. This injury and annoyance were caused by the so-called "canker worms." Readers of the Bulletin, Vol. IX, No. 3, June, 1914, on the "Early History of Brooklyn Entomology," by E. L. Graef, will recall especially the measures taken against these pests, including the introduction into this country of the English sparrow. Since then so much has been charged against this hyphenated alien that to his credit it should be said that, in the performance of his allotted task at least, he has done nobly. In Brooklyn today it is not a problem how to combat the canker worm, but rather how shall the collector find specimens sufficient for his cabinet. This at least has been my own experience for ten years or more. I have yet to see a really good series of these moths in any of the local collections.

The males of *Alsophila pometaria* the so-called "Fall Canker-Worm" can usually be readily distinguished by wing maculation alone, but a better character (especially for the apterous females) is the rows of strong spines on the abdominal segments of *P. vernata,* while the body of *A. pometaria* is densely covered with shingle like scales.

A. pometaria, known as the fall canker worm, as implied, should occur in the fall; yet in my own collection 2 males and 10 females all represent spring captures (with few exceptions from Prospect Park). My representation of the Spring canker worm, *P. vernata,* on the other hand, shows a preponderance of males, about 20 against 3 females, all from Prospect Park. The males of this species are by far the commonest of the early spring moths of the region, but until this year I failed to secure any females.

The finding in the spring of 1915 of a male *P. vernata in cop.* with a female *A. pometaria* proved puzzling at the time, suggesting the possibility of a third species. Eggs deposited about a week later were of the flower-pot shape typical of *A. pometaria* and experiments were not carried further.

While the paucity of the males of *A. pometaria* remains to be accounted for, the apparent scarcity of females of *P. vernata* can be explained by their habit of remaining at the base of trees, concealed by grass or fallen leaves until heavy rains or (as happened April 9, 1916) a heavy snowfall forces them to climb to greater heights. On that day 2 female *vernata* and 3 *pometaria* were collected in a short time.

That the Fall canker worm still appears in destructive numbers on Long Island, though at a considerable distance from the city, has been reported, especially as defoliating deciduous trees at Wading River. (Cf. BULLETIN papers by W. T. Davis, Vol. IX, p. 23, and Vol. X, p. 82.) Evidently our native insectivorous birds cannot be relied upon to check the insect pest. Therefore, let us give the devil (English sparrow) his due.

A NEW GENUS AND SPECIES OF NORTH AMERICAN CHLOROPIDÆ (DIPTERA).

BY J. R. MALLOCH, Urbana, Ill.

I obtained the species described herewith while collecting material for a paper on the immature stages of Diptera, now nearly ready for the press, and because it has no direct bearing upon that study, and in order to keep my other paper within reasonable compass, I have decided to publish the present description. While the manuscript containing this description was still awaiting disposal, Professor J. M. Aldrich brought to me for examination an example of the species, which has been recorded by me as a paratype in this paper. The type specimen is in the collection of the Illinois State Laboratory of Natural History.

Oscinoides gen. nov.

Generic Characters.—Wings elongate, costa to apex of fourth vein;

third and fourth veins ending at equal distances before and behind apex respectively; arista with short dense hairs; proboscis fleshy; scutellum not longer than its basal breadth, not flattened.

Type of genus, *Oscinoides arpidia* n. sp.

Oscinoides arpidia n. sp. *Female*.—Black and yellow, distinctly shining. Head yellow, blackened on upper portion of frons and almost the entire occiput; antennæ yellow, third joint slightly brownish; arista brown; proboscis and palpi yellow. Mesonotum yellow, with three black stripes which are fused anteriorly and cover the entire disc except on the margins and a central portion posteriorly, the latter having the appearance of an anteriorly bidentate spot; a black spot above wing-base; humeri and anterior portion of pleuræ yellow; scutellum yellow; postnotum black. Base and venter of abdomen yellow, the remainder black. Legs yellow; apical joint of midtarsi, entire hind tibiæ, and apical three joints of hind tarsi except base of third black. Halteres yellow, knobs white. Wings hyaline, veins brown.

Frons broad, flat, triangle occupying nearly its whole area, the surface with short hairs; vertex with the bristles strong; orbital hairs weak; antennæ rather large, third joint rounded apically; arista about as long as anterior width of frons, distinctly hairy; height of cheeks less than width of frons, distinctly hairy; height of cheeks less than width of third antennal joint. Thorax with moderately dense short hairs, one pair of prescutellar bristles on disc, and the same laterals as in *Gaurax*. Abdomen tapering at apex. Legs stout, the hind tibiæ more so than in species of *Gaurax*, the sensory area distinct. Wings long and narrow; second costal division (from end of first vein to end of second) nearly three times as long as third; last section of fifth vein slightly longer than penultimate section of fourth.

Length, 3 mm.

Type locality Urbana, Ill., June 1, 1916. One specimen taken by the writer among low vegetation in the Forestry of the University of Illinois. Paratype, Aberdeen, S. Dak., July 12 (coll. J. M. Aldrich).

The species is dedicated to Mr. R. P. Dow in recognition of his services to entomology in connection with the Bulletin of the Brooklyn Entomological Society.

A NEW MISCOGASTERID CHALCID FLY FROM MARYLAND.

By A. A. Girault, Glenndale, Md.

From the woods, June 4, 1916.

Miscogaster marilandica n. sp. *Female*.—Length 1.50 mm.

Æneous black, the wings hyaline, the legs and antennæ white, also the venation. Head and thorax finely, densely punctate, the thorax with sparse, small setigerous punctures; cross-suture of scutellum convexed a little at meson, the convexity distad. Propodeum with the spiracle small, round, central, the median carina paired, delicate; short striæ from the cephalic margin of the propodeum, the latter scaly, plane otherwise. Abdomen from above globular, depressed, much keeled beneath, its second segment occupying over a third of the surface, slightly incised at meson of caudal margin, the petiole distinct, wider than long. Postmarginal vein much longer than the stigmal, the knob of the latter moderate in size. Clypeus concave, its lateral end notched. Cheeks very short, not half the length of the eyes by far, the 13-jointed antennæ inserted distinctly below the middle of the face but above the ventral ends of the eyes; funicle 1 shorter than the pedicel, a little longer than wide, 6 wider than long; two ring-joints. Mandibles 4-dentate. Club without a terminal nipple.

Resembles *Trydymus aureipes* but is much less brassy, has a short petiole, the propodeum is plane, its spiracle round and central and the abdomen is shorter, not wholly depressed and so on.

From one female, Glenndale, Prince George Co., Md.

Type: Catalogue No. 20,312, U. S. N. M., the female on a tag, the head and caudal legs on a slide.

There are five females in the U. S. National Museum from Jacksonville, Fla.

PIRENE MARYLANDENSIS N. SP. (Chalcidoid Hymenoptera).

By A. A. Girault, Glenndale, Md.

From the woods, June 12, 1916.

Female.—The same as *marylandicus* Girault but the extruded part of the ovipositor is somewhat shorter and the antennæ are entirely different both in color and shape, besides bearing two very short, thin ring-joints: The scape is all black; funicles 1–2 are suffused with yellowish; the funicle joints are all subquadrate, 5 largest, twice the size of 1; the club lacks the small terminal nipple; and the tips of the tibiæ are but obscurely pale. Otherwise the same. Types compared. Clypeus as in *Trydymus.*

From one female, Glenndale, Prince George Co., Md.

Type: Catalogue No. 20,316, U. S. N. M., the female on a tag, the head on a slide.

The species *marylandicus* bears one very thin ring-joint. The scutellum in both bears a pitted but delicate cross-suture near apex.

A CHECKLIST OF THE HEMIPTERA.

The long expected Check-list of the Hemiptera, upon which E. P. Van Duzee has been working for many years, was published during the past summer by the New York Entomological Society. It covers 2,971 recorded species, but omits the Aphidæ, Aleurodidæ, and Coccidæ, and it replaces two existing checklists. While pretending only to be a checklist, it gives a fairly complete synonymy, full localities of species, and is arranged in proper order of species as they should be placed.

It is not the province of this Bulletin to print an extended review of this work (such has appeared already in many entomological periodicals). It is a necessity to all those interested in the Hemiptera, and in the interest of advancement of science the editor of the Bulletin will forward it to all wishing it, at the published price, $1.50, postpaid.

THE RHYNCHOPHORA OF EASTERN NORTH AMERICA.

It is remarkable that, considering the great output of books on Entomology during the last forty years and that a plurality of our Entomologists favor the beetles as objects of study, no good general or at all comprehensive work on the subject has ever been issued in this country. Even a check-list has been out of print for years. The best is the Beetles of Indiana by W. S. Blatchley, formerly Indiana State Entomologist, an excellent work which covers the state well and is fairly workable for the country north of Florida and east of the Rockies. This book is still in print, costing $6 plus postage. It omits the weevils.

In 1910 Mr. Blatchley began work on a new volume to cover Rhyncophora. A little later Mr. Chas. W. Leng, then President of the New York Entomological Society, began work on the American Museum collection, with a bi-weekly class of enthusiasts, with the idea of an eventual Monograph on the local Rhyncophora. The two authors combined their efforts, the result being the Rhyncophora of North Eastern America, pp. 682, published last month by the Nature Publishing Co., 1558 Park Ave., Indianapolis, Ind. It includes 1,084 species, of which 83 are new. The illustrations are 155, which is many more than have been previously gathered together. There is a key to every genus for identification of the species. Price $4 plus postage.

There is little doubt that the book will remain the authority on the subject for many years. It is a necessity to the Entomologist. Ed.

PROCEEDINGS OF THE BROOKLYN ENTOMOLOGICAL SOCIETY.

Meeting of February 11, 1916.—Fifteen members and three visitors present. The resignation of Mr. G. Beyer was accepted with the sincere regrets of the Society; Mr. Frank E. Watson also resigned. Long Island records: *Bellura gortynides,* three specimens from Long Island, *ex* Joutel collection, were shown by Mr. G. P. Engelhardt. This species is said to breed in cat tails; he had not been able to find it there, but he did find *Sphida obliqua,* which breed in pond-lily root-stocks, the former breeding in pickerel weed. It had not been found in Long Island because not sought for in the proper places. In the Middle States and Ohio the larvae are reported to be used for fish bait. The presence of the insect in the root-stocks can be detected by the oozy matter from the burrows. It is rare around New York. Mr. Funaro reported *Trechus borealis* from North Beach.

Scientific Programme: Mr. Davis showed specimens of Long Island Insects from his last summer's captures, his remarks being reported elsewhere in the BULLETIN. Mr. R. P. Dow, for Mr. Alonzo Davis, of Pasadena, California, read a paper on the Genus *Pleocoma,* which was published in the BULLETIN. Mr. Olsen showed a collection of Miridae and made remarks on occurrence, to be published later.

Meeting of March 16: Present thirteen members and four visitors. Mr. B. Preston Clark was elected to membership.

Scientific Programme: Mr. Ernest Shoemaker, under the head of Insects Collected Last Summer, showed the more interesting of his captures in Washington, D. C., and in the Catskill Mountains, N. Y. The Coleoptera included such interesting species as *Scaphinotus shoemakeri, Cychrus stenostomus, Pasimachus depressus, Myas coracinus, Helluomorpha nigripennis, Pterostichus purpuratus, Coptodera aerata, Chalcolepidius viridipennis, Clerus ichneumoneus, Leptura americana,* probably the first taken in Washington; *Odontota hornii, Odontonyx trivittis, Piezocorynus dispar, Merinus laevis, Strongylium terminatum, Cychrus pyrsolepis,* a very rare form, determined by Mr. C. Schaeffer; and *Athous scapularis;* in Lepidoptera *Catocala carissima* was taken September 24, and *Arctia virgo* and *Cerura multiscripta.* These were all taken in Washington. The principal Catskill species were *Smerinthus astarte, Ceratomia undulosa, Marumba modesta* and *Limenitis arthemis.*

Mr. Bueno, speaking on The Flat Bugs (Aradidae) of Long Island, showed 24 out of the 30 species that should be found, but only 5 were actual captures in the district, the rare *Aradus shermani,* the common and widespread pine species we call *A. cinnamomeus* of Panzer, the uncommon *A. uniformis,* picked up on the tide line in the wash-up on Fire Island Beach; *A. falleni* and *Neuroctenus simplex,* very common under the bark of dead oak saplings.

Mr. A. C. Weeks spoke on "Limitations of Mosquito and Fly Examination," and reviewed the work since its inception and the publication of the Lamborn Essays with copious citations from current accounts.

Meeting of April 13: Present thirteen members and two visitors.

Scientific Programme: Mr. Engelhardt read a paper on The Spring and Fall Canker Worms, published in this volume of the Bulletin. Mr. F. Conrad Pasch exhibited a collection of local and Arizona beetles, among the 200 species being many by no means common forms. Mr. Dow, under the title Bits of Entomological History, spoke of the simplicity and convenience of our scientific names, so often a stumbling block to the beginner. He maintained that they were more easy to understand than any English equivalent might be and cited examples to demonstrate this.

Meeting of May 11: Present fourteen members.

The death of Mrs. Geo. Franck was announced and on motion the Corresponding Secretary was instructed to express to our old friend Mr. Franck the sincere sympathy of the Society on the loss he had sustained and its appreciation of his many kindnesses to its members.

Long Island records: Mr. Engelhardt reported the capture on April 21st, of *Cicindela scutellaris, modesta* and *rugifrons,* at Cold Spring Harbor. On May 9, *Menecles insertus* was taken on the trunk of a maple. Mr. Olsen remarked that the previous records of this insect were from specimens found in the tide-line wash-up. Mr. Dow reported *Euphoria areata* from Lahaway, N. J., and stated that Mr. Joutel had reported it from Aqueduct, Long Island; he also found *Tricrania sanguinipennis* at Lahaway in company with *Tettix.* Mr. Schaeffer reported a capture by Mr. F. M. Schott, of *Dermestes pulcher* at South Amboy, N. J.

Scientific Programme: Mr. W. T. Davis and Mr. W. T. Bather spoke on Collecting in the Sunny South, where Mr. Davis found *Banasa packardi* on cedars. Mr. Bather related various experiences and reported *Eumaeus atala* abundant on Spanish bayonet. Messrs Englehardt, Schott and Davis dismiss the general subject of collecting in the South.

Meeting of June 15: Present eighteen members and one visitor. Mr. Dow, reporting on a trip to Lahaway, referred to the frost belt 15 miles long and 4 miles wide, which makes the locality unique and gives it a peculiar fauna and flora.

Long Island records: Mr. Wasmuth reported *Sphinx chersis* at East New York in August, 1915, a species not previously taken on the Island. Mr. Weeks reported the capture of *Pasimachus depressus* a week before.

Scientific Programme: Mr. C. E. Olsen, under the title Membracid Notes, showed a collection of the family and made remarks on their occurrence in New York. *Micrutalis calva,* an uncommon species, was among this material, from Flushing, L. I.

Mr. Bueno spoke on The Non-Gerrine Water Striders of New York and showed the five species of these found about New York, which are *Naeogeus burmeisteri,* heretofore known as *pusillus,* which is a European form not known here; a new species of the same genus from Yaphank, L. I.; *Merragata hebroides; Mesovelia bisignata* of Uhler, or, *mulsanti,* B. White is another common species, like *Hydrometra martini. Macrovelia horni* from California was shown, and *Hydrometra australis,* from Georgia. The only thing that binds this heterogenous assemblage together is the fact that they live on or near water, in damp places. Otherwise, they differ greatly in form and other characters.

Mr. Franck reported *Cicindela strigosa* from St. Petersburg, Fla.

J. R. de la Torre-Bueno, *Recording Secretary.*

THE BROOKLYN ENTOMOLOGICAL SOCIETY

Meetings are held on the second Thursday after the first Tuesday of each month from October to June inclusive, at 185 Brooklyn Avenue. The annual dues are $2.00.

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VOL. XI DECEMBER, 1916 No. 5

THE PRONUNCIATION OF INSECT NAMES.*

By A. L. MELANDER, Pullman, Washington

In any assemblage of biologists one can hear a given species called by a range of names, all spelled alike, that is eclipsed only by the changes in the names themselves necessitated by adherence to the law of priority. The tiger beetle, for example, is spoken of as *Єĭєĭndēla,*† *Ciçindēla, Cicindèla* or *Cicíndela,* according as one is trained in Germany, France, America, or is untrained. There is a right and a wrong way of doing things, as applicable to the pronunciation of scientific names as elsewhere. European trained entomologists are more consistent in their pronunciations than the average American, undoubtedly due to the greater emphasis placed on orthography during their school career than is encountered here. However, the pronunciation of foreigners, though correct from their viewpoint, is not the standard in America, and this article is written to call attention to some of the simpler rules governing the proper articulation of the names of insects.

According to the universally accepted rules of nomenclature the names of insects are Latin in construction. Custom has decreed that generic names be formed from Greek roots changed into

---

* Contribution from the Zoölogical Laboratory of the State College of Washington. Read at the summer session of the Entomological Society of America at Berkeley, California, August 4, 1915.

† In this discussion the accented syllable is marked with a grave accent (`) for a long vowel and with an acute accent (´) for a short vowel. Unaccented short vowels are indicated by a breve (˘) and unaccented long vowels by a macron (¯); ϶ indicates the sound of k and ç the sound of s; ȧ as in father.

Latin form and used as nouns to be modified by the species names used as Latin adjectives. Not infrequently, however, species names are derived directly from the Greek, as *microptera,* short-winged, instead of *parvipennis, erythrurus,* red-tailed, in place of *rufocaudatus, xanthopoda,* yellow-legged, in place of *flavipes,* etc., and sometimes, now not considered in good form, the names of species are merely euphonious combinations of letters. The English entomologist, Francis Walker, was especially prone to use words of no meaning but of pleasing sound, both for his genera and species, such as *Sýndyas, Anáxo, Édeta, Ámytis, Dària.* Such species terms are generally construed as neo-Latin proper nouns in apposition with the substantive generic name, by which construction they are ascribed an adjectival function. Ordinal and family names are in form Greek plurals. Thus we mention one Orthopteron, two Orthoptera; one Muscid fly but several Muscidæ. However, as cited in binomial nomenclature, all insect names, irrespective of origin, are considered as Latin and are governed by the rules of Latin pronunciation, which are fewer, simpler and more definite than the rules for English pronunciation.

There are three methods in vogue for the pronunciation of Latin, the Roman, the English and the Continental methods. The first of these is at least an approximation to the ancient pronunciation of the language and although taught in many if not most of our schools is almost never used in biological pronunciation. By this method, with its broad vowels and hard consonants, we would say *Ꞓiꞓindēla, Ꞓiꞓindelidæ, Chætòpsis, Geotrùpes, Œcánthus.** The Continental method retains the Roman pronunciation of the vowels and diphthongs but gives the consonants as they are used in English, thus: *Çiçindèla, Çiçindèlidæ, Chætòpsis, Geotrùpes, Œcánthus.* This method likewise is not in vogue in this country for biological pronunciation. As scientific names in the different countries usually follow the pronounciation of the language of the region, in America the English method of speaking Latin has naturally been applied. Accordingly the genera previously cited sound more familiar when called *Cicindèla, Chætópsis, Geotrùpes* and *Œcánthus.*

---

* Pronounced as if spelled with the English letters *Kē-kĭn-dā̆-lȧ, Kē-kĭn-dā-lē-dī, Kī-tōp-cēs, Gā-ō-trū-pās, Oi-cán-thoos.*

It is immaterial which system of pronunciation be adopted by the American entomologist and the following illustrations may be sounded to suit his pleasure. The careful student, however, will endeavor to place the accent on the proper syllable and to assign to the vowels their proper quantity. The following remarks are directed mainly toward the accentuation of generic names. Specific names are mostly pure Latin and can be found in any Latin dictionary, but the names of genera, being compounded usually from several roots, are less familiarly available.

Syllabication. As many syllables are required as there are vowels and diphthongs, the consonants being distributed as far as possible so that each syllable ends in a vowel. Should this result in unpronounceable combinations or interfere with the proper sounding of the vowels the consonents may require shifting. *Ci-cin-dè-la, Chæ-tóp-sis, Ge-o-trù-pes, Po-dà-brus, Sphæ-roph-thál-ma;* but *Ól-i-brus,* not *Ò-li-brus.*

The Roman and Continental methods divide compounded words into their constituent parts when the first part ends in a consonant, but this is not followed in English pronunciation. *Chæt-opsis, Sphær-ophthalma, Pod-urus, Sphec-odes.*

The family termination -ĭ-dæ is treated as an independent suffix even though such isolation sometimes modifies the sound of the preceding vowel. *Psỳ-che,* Psých-idæ; *Pi-è-ris,* Pi-ér-idæ; *Chry-so-mè-la,* Chry-so-mél-idæ; *A-pis,* Áp-idæ. However, there is abundant, though not consistent, sanction for such pronunciations as Psỳ-chidæ, Piè-ridæ, Chrysomè-lidæ, À-pidæ.

Accent. Polysyllabic names are accented on the penult if that syllable is long in quantity, otherwise on the antepenult. Dissyllabic names are always accented on the first syllable. *Ar-gýn-nis, Ba-si-lár-chi-a, Mòr-pho.*

Quantity. The quantity of a syllable, and of a vowel also, measures the time occupied in pronunciation. A syllable, irrespective of its vowel, is long in quantity if its vowel is followed by two consonants, excepting a mute (b, c, d, g, k, p, q, t) plus a liquid (l, r) or by the double consonants x or z. In this case the syllable is long by position, but its vowel is properly pronounced short. *Coccinélla, Cybíster, Bryáxis, Platypéza.* A syllable is long by nature if it contains a long vowel or a diphthong. *Anàtis, Formìca, Hylocœ̀tus, Panagæ̀us.*

A syllable is short in quantity if its vowel, not naturally long, is followed by another vowel. *Álaus, Dánaus, Lásius, Lèria.*

A syllable is common, *i. e.*, it may be considered either long or short, if its vowel, originally short, is followed by a mute and a liquid. Such syllables by preference should be shortened, but in Latin composition especially in poetry they show a tendency toward lengthening. Though comparatively few in number, it is this class of words that gives most perplexity to the entomologist, for until the original quantity of the vowel is known the pronunciation is doubtful. *Phálacrus, Ólibrus, Cónnophron, Ránatra, Ómophron, Éphydra, Hydrómetra, Ánabrus, Átropos, Háliplus, Geómetra, Nícocles, Tríprocris, Cutérebra,* all have a short vowel in the penult and the accent is thrown forward. *Cèbrio, Cràbro, Epòchra, Gymnètron* and *Tenèbrio* are given a long vowel before the mute and liquid, while *Arthromàcra* may lengthen the penult for easier pronunciation.

Vowels. In most cases vowels are given their customary long or short English sounds without regard to the niceties of intonation required in spoken English. However certain letters and certain positions exercise a modifying effect, as for instance the influence of the letter r on the preceding vowel in *Arthròpeas, Élater, Platygáster, Mòrpho, Phòra.*

Vowels, irrespective of the length of the syllable, usually have their long English sounds before another vowel or diphthong. *Empōásca, Eòis, Epèolus, Herìades, Hepìalus.* When occurring in an unaccented or short syllable i and y are given the short sound even when preceding another vowel. *Bíbĭo, Bembídĭum, Chàlĭa, Drastèrĭus, Melándrȳa.* Final a and usually unaccented a are broadened to sound like the final a in Africa. *Nómadȧ, Ȧèdes.*

Diphthongs in quantity are always long, thus when occurring in the penult carry the accent. *Passalœ̀cus, Corimelæ̀na, Zaræ̀a.* In quality, æ and œ are pronounced like e. *Ǣgèria, Ǽschna, Œcánthus, Œdicnèma, Polystœ́chotes.*

Vowels usually have their short English sounds before two consonants, excepting sometimes a mute and a liquid, and in accented antepenultimate syllables before one or more consonants. *Geócoris, Gómphus, Mācróbasis.*

The first factor determining the length of the vowel is its quantity in the original derivation. In the case of e and o of Greek roots this is readily accomplished for the long and short sounds in Greek are indicated by distinct letters, *eta* and *epsilon,* and *omega* and *omicron.* If the Greek root contains *eta* or *omega* the vowel in Latin form must be long. Thus *mērós* with long e means the femur and *méros* with short e means a part. The genera derived from the former must be accented on the long penult. *Calyptomèrus, Diapheromèra, Œdomèra, Monodontomèrus, Rhopalomèra, Acanthomèra.* The divisions of beetles, *Heterómera, Pentámera, Trímera,* founded on tarsal not femoral characters, and the genus *Oligómerus,* with few antennal joints, accent the antepenult, while *Ephémera,* lasting but a day, is an unrelated word with short e in the penult.

Sōma, meaning body, has a long *omega* in the original; *stŏma,* meaning mouth, is spelled with the short *omicron.* Thus *Brachysòma, Calosòma, Scaphisòma,* but *Brachýstoma, Belóstoma, Platýstoma.*

The Greek word *kĕras,* for antenna, is spelled with the short e. Thus, in *Acrócera, Bæócera, Criócerus, Heterócerus, Tetanócera,* the accent is thrown to the antepenult. But the wasp *Cercèris,* appropriating the old Latin name of a bird, takes the accent on the long e of the penult.

It is the quantity of the vowel of the penult that gives most concern because the position of the accent is determined by its length.

Apantèsis, Calephèlis, Caloptènus, Cyllène, Periplanèta, Leptotrachèlus, Euthèra, Philerèmus, Phylloxèra, Odynèrus, Metachèla, and *Zeuzèra* are derived from the long Greek *eta* in the penult, while *Borèus, Cartodère* and *Diapèris* descend from the diphthong ei. Hence all of these have similar accent.

Émesa, Théreva, Eùmenes, Nemótelus, Órmenis, Oxýbelus, Pǽderus, Polýmedon, Phrygànea, Platýdema, Hypóstena and *Sépedon,* to mention only a few commonly mispronounced names, have the short *epsilon* in this position and hence throw the accent forward to the antepenult.

Properly, words ending in *-pĕza* are pronounced with a short e. *Micropéza, Platypéza, Tanypéza, Leptopéza.* Since in English pronunciation z is no longer the double consonant dz, these words are commonly though improperly given as *Micropèza, Platypèza, Tanypèza.* In the same group comes *Trióza,* but usage has made the vowel as well as the syllable long in *Chylìza, Pipìza, Mỳzus* and its series of related *-myza* genera, like *Agromýza, Anthomýza, Helomýza, Phytomýza,* and *Sciomýza.*

Names ending in *-opus* give some confusion until the derivation is known. *ōps* means face, but *pous*, with root *pŏd,* means foot. *Œdòpa Psilòpa, Systròpus, Cœlòpa, Chrysòpa, Desmometòpa* come from the former root, while *Œdopus, Psílopus, Dolíchopus, Bythóscopus, Plátypus, Polycéntropus* and *Gýropus* are names referring to leg structures.

The following generic names are formed with the long Greek *omega* in the accented syllable. *Diabròtica, Diplòsis, Melanòtus, Haplòa, Priònus, Sitònes, Cyrtopògon.* Names ending in *-ōdes* have an accented penult. *Aleyròdes, Eleòdes, Oncòdes, Orneòdes, Melissòdes, Phengòdes.*

The short *omicron* occurs in the penult of: *Ágrotis, Chirónomus, Dendróctonus, Ómophron, Perícoma, Pleócoma, Pyróchroa, Stenólophus, Sýnchroa, Mèrodon, Tóxotus, Neócota, Xyléborus, Xylócopa.* Similarly *coris* (bug) and *toma* (*temno,* cut) throw the accent forward: *Geócoris, Leptócoris, Thyreócoris; Hylótoma, Neurótoma, Pentátoma, Trítoma.*

The diphthong oi is not found in classic Latin although it is good Greek. Hence when it is brought into Latin form in proper names derived from the Greek the o and i should be separately pronounced. Hence *Culicòides, Sanninoídea, Blattoídea* and *Coleopteroídea* are preferable to pronouncing the oi as in coin.

A class of genera, the pronunciation of which is disputed, includes those founded on personal proper names. Should the pronunciation of the genus name follow Latin rules, thereby often distorting the proper name so as to bear little resemblance to its original form, or should the original pronunciation, even of foreign names, be retained? In as much as such genera are founded as a mark of honor the latter course seems preferable. Some examples follow to show the difficulties experienced with these names: *Bruesia, Candezea, Dejeania, Guerinia, Latreillia, Macquartia, Meigenia, Rondania, Schineria, Schönherria, Scudderia, Stâlia.*

As we have seen the quantity of the radical syllables can often not be determined by rule and must be ascertained by the laborious process of searching Greek and Latin dictionaries. Certain terminations, however, have a common pronunciation, and when used as derivative endings, not as part of the root, give a clew as to accent.

Thus the long penult occurs in:

-ētes, -ētus, -ētis.
Collètes, Corynètes, Colymbètes, Nomarètus, Trypèta, Eutrèta, Synèta, Lithocollètis. (But *Drápetis.*)

-ītes, -īta, -ītis.
Ægialìtes, Myodìtes, Rhodìtes, Rhinchìtes, Sphærìtes, Nebrìtus, Coptodìta, Galerìta, Omosìta, Trogosìta, Dorìtis, Limenìtis, Pyrìtis.

-ōdes, -ōda.
Aleyròdes, Oncòdes, Orneòdes, Pissòdes, Psychòda, Lyròda.

-ōtus, -ōtes, -ōta, -ōtis.
Chrysòtus, Odontòta, Pyrgòta, Xylòta, Chyphòtes, Lucidòta, Plusiòtis.

-ānus.
Lucànus, Silvànus, Tabànus. (These are of Latin origin. The Greek *Stéphanus, Drépana, Ídana,* have a short penult. *Chrysophànus* has a long penult from the Greek *phaino.*)

The short penult occurs in:

-ulus, -ula.
Pipúnculus, Plenóculus, Forfícula, Libéllula, Nitídula, Típula.

-olus, -ola.
Epèolus, Mayetìola, Reduvìolus, Tinèola. (*Mineòla* is apparently an Indian name.)

-alus, -ela.
Anómala, Hárpalus, Liáncalus, Tríbalus Cístela Rùtela (Latin, *rutilis*). *Hepìalus* is in Greek *Hepiolos* and belongs in the preceding section. In *Pteromàlus* and *Catocàla* the long a belongs to the stem.

-ales, -alis, -eles.

Anópheles, Cerópales, Corýdalis, Erístalis, Eùpsalis, Pýralis, Órtalis, Sìalis. But *-ālis* used in species names accents the penult: *farinàlis, discàlis, purpuràlis. Nócheles, Apánteles, Lophóteles, Conótelus* have a short e of the root in the penultimate syllable.

-ides, -īades.

Herìades, Dalcérides, Mystácides, Nisonìades. But *Iphiclìdes,* from the Greek *Iphikleidēs,* according to a special rule affecting patronymics ending in -ēs (*Iphikleēs*).

-ion.

Ágrion, Ápion, Chlòrion, Elaphídion, Óphion, Zòdion. But *Diprìon* (*prion,* saw). When such words come directly into English from the Greek the penult is pronounced long, e. g. *Orìon.*

-arus, -aris.

Ámara, Hílara, Scìara, Chálarus, Cántharis, Hémaris. In *Trichobàris* the long a belongs to the stem.

-eva.

Théreva, Chóleva, Lésteva, Átteva.

-ica.

Háltica, Sérica, Podàgrica, Tómicus.

Names ending in -inus, -ina are perplexing. Among the most familiar the following have a long penult: *Balanìnus, Blapstìnus, Brachìnus, Carposìna, Clivìna, Gyrìnus, Hæmatopìnus, Harrisìna, Lycoperdìna, Mellìnus, Pelecìnus, Saprìnus, Staphylìnus.* The Latin name *Lícĭnus* and the Greek forms *Cerátina, Scenópinus, Thinópinus, Xanthólinus, Táchina* and *Táchinus* have the penult short. Subfamily and tribal names ending in -inæ, -ini, have a long penult; thus, Carabìnæ, Harpalìni.

The following list includes a miscellaneous set of names often mispronounced: *Ancỳlis, Ánthicus, Antispìla, Brachýstegus, Calìgo, Callídryas, Callígrapha, Cerópales, Cùcujus, Chauliógnathus, Chelònus, Chermes, Schizoneura* (Greek ch is always like k), *Coccinélla, Dìplax, Émesa, Endomỳchus, Eròtylus, Eùdamus, Eurèma, Eùrymus, Feníseca, Graptólìtha, Hippodamìa, Hýpatus, Icèrya, Lagòa, Lepidósaphes, Lophỳrus, Lyméxylon, Macròphya,* *Megaspìlus, Megathỳmus, Mycetóchares, Myrmìca, Némătus, Nemógnatha, Nómada, Opóstega, Oxýptilus, Pachýbrachys, Paleácrita, Pemphìgus, Pìeris, Ponèra, Sitotròga, Stenòma, Sýstena, Tachýporus, Tétracha, Trypóxylon, Typhlócyba, Ypsólophus.*

The family termination -idæ, meaning like, is added to the root of the typical genus. The i is short, so the accent precedes this suffix: Carábidæ, *Cárabus*-like; Dytíscidæ, *Dytíscus*-like. When the root differs from the nominative the family name may become lengthened: Lepismátidæ, based on the genus *Lepísma;* Belostomátidæ, based on *Belóstoma;* Calamocerótidæ, based on *Calamócerus.* But Apiocéridæ, Leptocéridæ, Tetanocèridæ have had such long usage that to use Apiocerátidæ, etc., would appear pedantic. Genera like *Acrídium, Anthomỳia, Cecidomỳia* and *Stratiomỳia* form the family names Acridìidæ, Anthomyìidæ, Cecidomyìidæ and Stratiomyìidæ. To unite the ìí would produce a long vowel, resulting in such words as Acridìdæ, Anthomyìdæ, Cecidomyìdæ, more awkward than the cumbersome longer form.

Finally, in determining the pronunciation, the most useful single rule, especially for those familiar with spoken Spanish, is to regard the accent as recessive, considering the penultimate vowel as short unless there is good reason for believing it long.

ON THE OCCURRENCE OF VESPA AUSTRIACA PANZER IN THE NORTHEASTERN UNITED STATES.

By J. Bequaert, American Museum of Natural History, N. Y.

There are many facts in the taxonomy and still more in the life-histories of the common American wasps (*Vespa*) which need a thorough revision. The following small contribution is made with the hope of interesting other entomologists in the subject. During the last summer, the writer made a point of capturing all the specimens of wasps he met with on his collecting trips, but the result as a whole was very poor, 1916 apparently not being a wasp-year. However, amongst the catch were found two females which he was unable to refer to any of the species previously known from North America and it was found that they belonged to what is called in Europe *Vespa austriaca* Panzer.

The following description of the species is made on these two American specimens:

Vespa austriaca Panzer, Fauna Ins. German. LXIII, 1799, p. 2, Tab.

Synonyms: *Vespa borealis* Smith, The Zoologist, I, 1843, p. 170 ♀ (nec Kirby, 1873; nec Lewis, 1897).

Vespa arborea Smith, The Zoologist, VII, 1849, Appendix, p. LX.

Pseudovespa austriaca O. Schmiedeknecht, Entom. Nachr. VII, 1881, pp. 317 and 318.

♀. Head slightly broader than high. Clypeus comparatively high, scarcely one third broader than high, its anterior margin much projecting, distinctly emarginate, *the lateral angles of the emargination strongly produced,* almost dentate and slightly directed outwardly. Oculo-malar space very short, the eyes practically reaching the base of the mandibles. Mandibles relatively slender, when compared with other species. *Tarsi distinctly heavily built,* the joints are as broad as in other species but much shorter. *Horizontal face of first abdominal tergite* comparatively long and narrow, *about half as long as the second tergite.—Punctuation remote and fine on head and thorax;* especially on the clypeus there is, in this respect, a marked difference between this and related species. On the mandibles also the sculpture is very obsolete.—The whole body is covered with erected black hairs, which are very noticeable on the abdomen. *Upper side of all the tibiæ clothed with very long erect hairs,* more abundantly so on the hind legs.

Coloration.—Black with many pale lemon-yellow markings: a broad lozenge on the front between the antennæ, the under half of the sinus of the eyes, a large spot in the upper half and a much smaller one near the under end of the temples (behind the eyes), nearly the whole of the mandibles, *the clypeus except for its margins and 3 small black spots placed in a triangle on the center.* In one specimen, the underside of the antennal scape bears a short and narrow yellow stripe; in the other, the scape is entirely black.—On the thorax, the lateral hind-margins of the pronotum are broadly yellow, as are also two widely separated spots on the scutellum and a smaller one on the upper half of the mesopleuræ beneath the insertion of the wings. Tegulæ, yellow and brownish.—On the legs, the apices of the femora, the tibiæ, with exception of a black stripe on the under side, and the tarsi are yellow, this color, however, turning in certain parts brownish.—First abdominal tergite with a broad apical yellow margin, in front of which are situated, on the transition between the horizontal and vertical portion, two transverse, entirely free, yellow spots. The remaining segments are, for the largest part, yellow; there is a basal black band which is angularly produced in the center, and on each side of this angle a transverse black spot; on the second tergite the basal black band is much broader and its angular projection extends backwards as to be connected with the lateral spots. Sixth tergite yellow with a broad brown apex and a median longitudinal black band. Sternites two and three with a terminal black fascia which is much broadened on the sides and encloses there a transverse black spot; the fourth and fifth tergites show also an indication of a similar pattern. The coloration of the abdomen is not mixed with brownish, except on the ventral face, where there is a slight brownish tinge on the boundaries between the black and yellow markings.

Length: total, 16 mm.; from front of head to posterior margin of second segment, 12 mm.

2 ♀ from Fort Lee, N. J., July 16, 1916.—Professor J. S. Hine has shown me a third ♀ specimen which was caught by him the same day on Staten Island, N. Y., on flowers of sumach (*Rhus typhina* L.)

Except for the difference in the color of the antennal scape noted above, these three specimens agree in every respect. I was also able to compare them with a *Vespa austriaca* ♀ from Switzerland, for which I am indebted to the generosity of the well-known French hymenopterologist, Mr. J. de Gaulle. In sculpture, structure and pubescence I can discover no difference between the European and the American specimens. The coloration also is very similar in the European ♀: the black spots on the clypeus are very small, the underside of the antennal scape has a broader yellow stripe, the postscutellum bears two minute lateral yellow spots and the ventral face of the abdomen is richer yellow. However, coloration is a very secondary matter in the wasps, and it is well known that English specimens of *V. austriaca* are paler in color than those of Continental Europe.

Vespa austriaca Panzer is not closely related to any other American species, its nearest relative being the European *Vespa rufa* L. Of the latter species I have never seen a North American specimen in any of the collections I was able to look over. R. du Buysson (1905), however, describes of this species a var. *intermedia* from Hudson Bay, and a var. *americana* from Quebec. I am inclined to believe that these American specimens belong to *Vespa consobrina* Sauss., which, although very different in coloration, is very probably the American race or subspecies of *Vespa rufa* L.

Vespa austriaca comes in the group of species with short oculo-malar spaces, where the eyes reach very nearly to the base of the mandibles. This group includes, in North America: *V. carolina* L., *V. sulphurea* L., *V. vidua* Sauss., *V. consobrina* Sauss., *V. occidentalis* Cress., *V. pennsylvanica* Sauss.* and also the common yellow-jacket, *Vespa communis* Sauss.† All these, however, differ from *V. austriaca* inter alia by the absence of long hairs on the upper side of the tibiæ‡ and very often also by the shape of the clypeus, which in most of the species has broadly rounded lateral angles.

V. austriaca Pz. is a very scarce wasp in Europe. It was recorded from Switzerland, the Vosges, Southern Germany, Western Austria, near St. Petersburg, Southern Sweden, the Pyrenees, Upper Italy, and the British Islands, and shows a marked preference for mountainous regions where it goes as high as 1,800 meters. J. Pérez records a ♂ from Shang Hai.

The life-history and even the identity of this wasp was long a puzzle; early writers thought it to be only a color-variation of *Vespa rufa* L. Giraud (1862) was the first to point out the structural differences between the two forms, and since that time *V. austriaca* has generally been accepted as distinct. Curiously enough, R. du Buysson, in his recent Monograph of the genus *Vespa* (1905), returns to the older opinion and gives *austriaca* merely as a variety of *rufa,* although he indicates the characteristics of both forms.

Owing to some very remarkable biological facts, the question of the relationship of *V. austriaca* to *V. rufa* (or to other species of wasps) goes far beyond the usual interest of discussions as to species and varieties. Though both ♂ and ♀ of *V. austriaca* are well known to European entomologists, workers referable to it with certainty have never been found. So the suspicion arose that this species has no workers, but breeds as an inquiline in the nest of some other species. This suggestion, first made by Morawitz (1864), was strongly supported by Schmiedeknecht (1881) and Holmgren (1883). But it was not until 1898 that direct observations, made by Robson, supported the belief of inquiline relationship between *V. austriaca* and *V. rufa*. However, by far the most important paper on the subject was published in 1903 by G. H. Carpenter and D. R. Pack-Beresford. These authors not only made a complete comparative study of the two forms, but they attempted also to become more closely acquainted with the exact nature of the relations existing between them.

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* I came recently to the conclusion that *Vespa occidentalis* Cresson and *V. pennsylvanica* Sauss. are two very distinct species. R. du Buysson (1905) brings them together as synonyms.

† This species is commonly identified as *V. vulgaris* L. or *V. germanica* F. in American collections. I have seen no American specimens which correspond exactly to these European species. Moreover, *V. communis* Sauss. is apparently the American race or sub-species of *V. vulgaris* L. In a similar manner, *V. pennsylvanica* Sauss. (but not *V. occidentalis* Cresson) may be a subspecies of *V. germanica* F.

‡ These long hairs on the tibiæ exist in all the American species with long oculo-malar spaces, such as *V. maculata* L., *V. diabolica* Sauss., etc.

In résumé, three different opinions may be held as regards the relation existing between *V. austriaca* and *V. rufa*.

1. The older opinion, recently renewed by R. du Buysson, sees in *V. austriaca* merely a color-variation of *V. rufa*. The ♀ and ♂ *austriaca* have then in the economy of the nest the same standing as the ordinary *rufa* ♀ and ♂. This can hardly be accepted any longer, as there are many structural characters separating both forms and, furthermore, this does not explain why no workers presenting the structural peculiarities of *austriaca* are found.

2. The inquiline theory as presented by Schmiedeknecht, Robson and J. Pérez (1910): according to this, *V. austriaca* is a distinct species, whose ♀ and ♂ play in the *V. rufa* nest the same rôle as the *Psithyrus* ♀ and ♂ in the *Bombus* nests. The ♀ of *austriaca* invades the nest of a *V. rufa,* lays its eggs in the cells and the hatching larvæ are fed by the *rufa* workers.

3. The opinion of G. H. Carpenter and D. R. Pack-Beresford is in some respects intermediate between the two preceding theories. They believe that *V. austriaca* and *V. rufa* must have diverged from a common stock in comparatively recent times. They add further: "The observations that we have been able to make on the nest containing both forms strongly incline us to the view that, although their differences are apparently 'specific,' there is a direct genetic relationship between them and that they may be regarded as races of one and the same species. . . . We conclude,

therefore, *that the old austriaca queen was the foundress of the nest, and that both the rufa and austriaca form are her offspring.* . . . As regards the precise relationship between *V. austriaca* and *V. rufa* we believe that the former represents the ancestral stock of the latter, because *V. rufa* shows distinctly more tendency to vary, while the rarity and discontinuous distribution of *V. austriaca* suggest that it is the older form. . . . Moreover, as all the workers of these wasps are clearly referable to *V. rufa,* it seems that *V. austriaca* points us back to a time in the history of the race before the worker had become differentiated from the queen." The authors believe that, if their view be established, the development of *rufa* offspring from *austriaca* parents would be a very striking instance of "discontinuous variation," as the structural differences between the two wasps are quite sufficient to warrant "specific" distinction in the ordinary sense of the term.

Unfortunately the facts on which Carpenter and Pack-Beresford base their theory are very feeble, and they can just as well be explained by the ordinary inquiline theory.

I have given at length the opinions held by different writers, because I believe that the discovery of *V. austriaca* in North America may, perhaps, furnish some evidence to support one or another of the preceding theories. In fact the sudden appearance of this species in the New World is in itself well worthy of study. It is not likely that this wasp has been overlooked so many years in this country, for several of the larger collections which I have examined do not contain a single specimen of it. It is therefore most probably a recent immigrant from Europe. However, the capture of 3 ♀♀, in very fresh condition, in two different localities, makes it improbable that these specimens were imported as adult insects or even in the pupal stage. I am rather inclined to believe that the species is already in some way connected with one of the American wasps. No supposition as to the nature of these relations can be made at present. As seen above, direct observation showed in Europe that *V. austriaca* is associated with *V. rufa,* but the latter insect has never been found in the Eastern United States.

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TWO NEW SPECIES OF CEBRIO (COL.).

By Charles Schaeffer, Brooklyn, N. Y.

Cebrio antennatus new species.—Castaneous, head black or piceous, antennæ, legs and underside paler. Head moderately densely punctate; labrum emarginate; mandibles as in *bicolor;* last two joints of maxillary palpi nearly equal in length; antennæ rather strongly serrate, reaching to about basal fourth of elytra, third joint about half as long as fourth, last joint elongate and feebly constricted. Prothorax transverse, sides almost straight, rather feebly converging towards apex, hind angles feebly divergent, surface moderately coarsely, not densely punctate. Elytral striæ rather feebly impressed; intervals nearly flat and moderately densely punctate. Prosternal process nearly as wide between the coxæ as in *bicolor*. Abdomen finely, not closely punctate; last ventral more densely punctate than the other segments, apex entire and broadly rounded. Length 17 mm.

Arkansas (coll. Dietz).

This species is closely allied to *C. bicolor* from which it differs in having longer antennæ, entire last ventral segment, which is feebly emarginate in *bicolor,* almost flat intervals and rather feebly impressed striæ of elytra.

Cebrio emarginatus new species.—Dark testaceous, head piceous, prothorax dark brown, abdomen, legs and antennæ paler. Head moderately densely punctate; labrum deeply triangularly emarginate; mandibles rather short and stout; last joint of maxillary palpi shorter than the preceding; antennæ feebly serrate; joints elongate, third joint about twice as long as the second and more than half as long as the fourth. Prothorax transverse, hind angles not divergent, sides nearly straight, narrowing to apex; surface somewhat sparsely punctate, punctures moderate. Elytral striæ shallow, punctures almost obliterated in about basal half, towards apex more distinct; intervals moderately convex, finely and moderately closely punctulate. Prosternal process between the coxæ relatively broad and rather suddenly convex. Abdomen finely and sparsely punctate; fifth ventral segment rather deeply emarginate. Length 15.5 mm.

New Mexico (coll. Dietz).

The prosternal process in this species is rather wider than in *bicolor* Fab., from which it otherwise differs in having shorter mandibles and a much longer third antennal joint; from *mandibularis, estriatus* and *compositus* it differs in having a much wider prosternal process.

A KEY TO THE MALES OF THE ANTHOMYID GENUS HYDROTÆA RECORDED FROM NORTH AMERICA (DIPTERA).

By J. R. Malloch, Urbana, Ill.

There is a pronounced dearth of literature in English upon the North American Anthomyiidæ, and remarkably few keys to the species of the various genera in either English or German. The key presented herewith will prove useful to students who either can not obtain access to papers dealing with the species included or may not have time to analyze descriptions in order to discover the distinguishing characters of the species.

The males of this genus may be readily separated from those of other anthomyid genera by the following combination of characters: eyes contiguous or subcontiguous, proboscis fleshy; palpi normal; thorax with 4 pairs of post-sutural dorso-central bristles; squamæ unequal in size; sternopleura with 2 bristles (1 : 1); sixth vein of wing incomplete; fore femora with 1 or 2 stout forwardly directed thorns near apices on ventral surface.

KEY TO IMAGINES, MALES.

1. Hind femora with either a single stout downwardly directed spine or a closely approximated pair of such spines on ventral surface......2
Hind femora without such spine or spines.........................6
2. Hind femoral spine near base...................................3
Hind femoral spine or spines near middle.........................4
3. Hind tibia with a conspicuous tuft of long hairs about one third from apex on ventral surface.............................*occulta* Meigen.
Hind tibia without such tuft of hairs; mid metatarsus with about 4 long hairs on each side...............................*acuta* Stein.
4. Eyes bare; fore femora with a few long bristles on basal half, the apices of which are slightly knobbed; hind femora with 1 spine. *armipes* Fallen.
Eyes distinctly pubescent; fore femora with the bristles acute apically..5
5. Mid femora with a number of long curled apical bristles; hind femora with 1 ventral spine..............................*ciliata* Fabricius.
Mid femora without long curled apical bristles; hind femora with a closely approximated pair of ventral spines........*cressoni* Malloch.
6. Wing with a conspicuous patch of upright microscopic hairs at apex of discal cell....................................*militaris* Meigen.
Wing without such patch of hairs...............................7
7. Mid metatarsus with abnormal armature, either furnished on the entire ventral surface with stiff spinules that are at right angles to the surface of the joint, or with a number of long hairs..............8
Mid metatarsus with the normal armature, consisting of more or less closely placed regular spinules which are directed slightly toward the apex of the joint..9
8. Mid metatarsus armed on its entire ventral surface with short stiff spinules which give it the appearance of being slightly thickened. *irritans* Fallen.
Mid metatarsus with a slight depression near apex on ventral surface the posterior margin of which is fringed with a comb of from 4 to 6 short, stiff, downwardly directed bristles........*metatarsata* Stein.
9. Hind tibia about one third from apex on the inner surface armed with a stout downwardly and apically directed spine which ends in 3 hairs. *unispinosa* Stein.
Hind tibia without such spines...................................10
10. Mid tibia with 1–2 bristles on anterior surface....*bispinosa* Zetterstedt.
Mid tibia without bristles on anterior surface.....................11

11. Hind tibia slightly prolonged into a blunt apical process on ventral surface; mid femora without long bristles on basal half of ventral surface; hind tibia with 2–3 ventral bristles......*dentipes* Fabricius.
    Hind tibia normal at apex; mid femora with 6–7 long bristles on basal half of postero-ventral surface; hind tibia with 1 ventral bristle or with only ventral setulæ......................................12
12. Mid tibia with a continuous series of very short upright hairs from base to apex on anterior surface; mesonotum distinctly shining and vittate..*houghi* n. sp.
    Mid tibia without short upright hairs; mesonotum dull velvety black, not vittate......................................*meteorica* Linné.

Hydrotæa houghi, n. sp.—*Male.*—Black, distinctly shining, slightly bluish on dorsum of thorax and abdomen. Head black; ocellar triangle shining; interfrontalia opaque; orbits, face, and cheeks with silvery pile. Thorax vittate, the vittæ consisting of whitish pruinose stripes covering the regions occupied by the acrostichal and dorso-central bristles, the intervening spaces showing as narrow black lines. Abdomen with whitish pruinescence, which gives the surface a slightly tessellate appearance; dorso-central stripe slender, most distinct at base. Legs black. Wings clear or slightly grayish. Squamæ whitish. Halteres brown, knobs black.

Eyes narrowly separated, almost entirely bare; arista tapering, pubescent. Thorax with 3 pairs of strong presutural acrostichals. Thorns on fore femora of unequal strength, the posterior one much more acute than the anterior; 4 long blunt bristles on basal half of postero-ventral surface, a series of short stout bristles on basal half of ventral surface, and 4 or 5 similar bristles on same surface just basad of the thorns distinguish the femora. Mid femora with a series of very long curled bristles on basal half of anterior surface and another one of straighter bristles on same portion of postero-ventral surface. Mid tibiæ with their anterior surfaces covered with tiny upright hairs; posterior surfaces with 2 bristles, one above and the other below middle. Hind femora with a series of stout bristles on the apical half of their antero-ventral surfaces and 2 complete series of long fine hairs on their ventral. Hind tibiæ with short hairs, distinct from which are 3–4 antero-ventral setulæ, one weak antero-dorsal bristle, a very strong dorsal bristle, and the usual preapical bristle. Third and fourth wing-veins convergent apically.

Female.—Agrees in color with the male except for the more distinct pruinescence of the dorsum.

The eyes are separated by one third the head-width. The fore femora have no characters that distinguish the species from *dentipes.* The mid tibiæ have one bristle one third from apex on anterior surface in addition to the 2 on the posterior surface. The antero-ventral setulæ on hind tibiæ are stronger than in the male. In other respects except as to the femoral bristles the female is similar to the male.

Length, 7–8.5 mm.

Type locality, Homer, Ill., April 24, 1909—a large series, mostly females. Paratypes, Urbana, Ill., April and June; Algonquin, Ill., April and June; Claremont, N. H., October 16, 1915 (R. P. Dow); Tifton, Ga., October 16, 1896; Opelousas, La., March; London, Ont. (ex. coll. Hough).

The Hough specimens are labeled *dentipes,* as is also one of the Algonquin specimens from Dr. Nason. It is highly probable that this species is the one that has been recorded as *dentipes* from North America.

NEW SPECIES OF PARASITIC HYMENOPTERA.

By A. A. Girault, Glenndale, Md.

Two New Tetrastichomyiæ. The species of this genus, all of North America, may be known by the following synopsis:

Club white. Pedicel subequal to funicle 1.
  Scape, pedicel and ring-joints white; entire thorax (except tegula) and abdomen reddish yellow except the base and lateral margins of the abdomen (the latter to about the middle) and a large median, rounded spot distad at apex of abdomen. Coxæ silvery. *silvensis* n. sp.
Club black. Pedicel somewhat longer than funicle 1.
  Scape, pedicel and ring-joints white; head, thorax and abdomen black except at least the venter and pleurum of thorax, the proximal part of the scutellum, the mesal part of the axillæ which are reddish yellow and the propodeum and postscutellum which are yellowish silvery .... *clisiocampæ* Ashmead.
  The same but the distal third of the pedicel black (except at apex), the body entirely black except the propodeum and, less distinctly, the proscutellum, which are pale yellow.................. *orgyiæ* n. sp.

The median carina of propodeum is distinct, no lateral carinæ; mandibles more or less 3-dentate; club with a distinct terminal nipple. Legs yellow, the coxæ whitish; body reticulated, impunctate. Propodeal spiracle round, central. Pedicel elongate. Wings lightly infuscated except at base; postmarginal vein absent (a mere bud). The species do not differ except in coloration. Caudal tibial spurs single. Types of *clisiocampæ* Ash. examined.

1. *Tetrastichomyia silvensis* Girault. One female, woods, Glenndale, Md., July 16, 1915. Type: Catalogue no. 20398, U. S. N. M., the female on a tag, the head, a forewing, and a hind leg on a slide.

2. *Tetrastichomyia orgyiæ* Girault. One female reared from *Orgyia leucostigma,* Washington, D. C., Nov. 1915 (R. M. Fouts). Type: Cata-

logue no. 20399, U. S. N. M., the specimen on a tag and a slide with same appendages as in *silvensis.*

Decatoma marylandica n. sp. (Chalcid Hymenoptera). From the woods, June 26, 1916. Female: Length 2 mm. Entirely black, the wings without a substigmal blotch (*Endecatoma*). The following parts golden yellow: Propleurum except quadrately caudo-ventrad; legs except proximal half of caudal coxa; middle of caudal femora and tibiæ; and the middle tibiæ more or less; and the pedicel except at apex. Shallowly umbilicately punctate, the propodeum ruguloso-punctate, with a narrow, foveate median channel, through a peltate basin, the petiole a half longer than wide, scaly; segments 2–4 of abdomen subequal, glabrous. Pedicel a little longer than funicle 1, funicle 2 quadrate. Stigmal vein distinct, small. The yellow on the propleurum is visible above.

An ordinary species. Glenndale, Md., one female. Type: Catalogue no. 20364, U. S. N. M., the above female on a tag. One female in the U. S. N. M. from Oak, D. C.

Two New Chalcid Flies from Maryland. *Elachistus marylandicus* n. sp. Female: The same as *louisiana* Girault but the lateral margin of the abdomen is dusky only for two thirds its length from base (or to a third cross-stripe) and there are three narrow cross-stripes at about the middle and two more slightly indicated between these and base from each side. Club solid, pointed at apex, the mandibles edentate, obtuse at apex.

Two females, open woods, Aug. 12, 1916. Glenndale, Md. Types: Catalogue no. 20442, U. S. N. M., the females on a card point or tag, hind tibiæ and a head on a slide. A third female same place a week later.

Aprostocetus ulysses n. sp. Female: Length 0.80 mm. Dark metallic purple, the wings hyaline, the antennæ (except base of pedicel above and club 3 which are purplish) and the legs except base of front coxæ, yellowish white, the abdomen pale golden except the margins all around (except at base, more broadly at the middle at the cross-stripes), the apex rather broadly and three cross-stripes (the second at middle, the three in succession, the first often broadly interrupted at the middle, the third often represented by a spot at meson). With the usual sculpture, the line of punctures along lateral scutum minute, obscure, the propodeum short at the meson, then with a weak median carina; no lateral carinæ, the spiracle minute, round, central. Thorax rounded, the abdomen narrower, conic-ovate. Pedicel slightly longer than funicle 1; funicle 2 longest, somewhat over twice longer than wide, 3 a little shorter, subequal to club 2; funicle 1 nearly twice longer than wide, longer than club 3 which bears a distinct terminal nipple. Mandibles bidentate.

Two females. Meadows by sweeping, Aug., 1916. Glenndale, Md. Types: Catalogue no. 20445, U. S. N. M., the two specimens on a tag, two heads on a slide.

Gonatocerus novifasciatus Girault. Common in Maryland woods. The distal half of the forewing is somewhat infuscated. The propodeum bears a pair of median carinæ which are not very close together. Scutellum without sulci.

A new Eucharid Chalcid-Fly from Maryland. From the woods, June 12, 1916. *Pseudometagea hillmeadia* n. sp. Female: A little larger than the genotype from which it differs as follows: The general color is lustrous black not dark brown; the head and thorax bear more numerous pin punctures (in both the vertex bears a bifoveate median sulcus and is rugulose on each side of this); the scape (excluding the bulla) is about twice longer than wide, in the other only slightly longer than wide; the broad, rugulose cephalo-mesal part of the scutum is longer, reaching nearly to the middle; the parapsidal furrows, punctate, are complete and distinct, absent in the other (in the type female; present in the other specimens placed with the type); the femora are broadly blackish at base, concolorous in the others. Otherwise the same. Types compared. Scutellum with a cross-row of foveæ at base, a few longitudinal striæ laterad and a median channel Propodeum honeycombed Petiole nodular, a little larger than the coxæ. Abdomen a little ascending, elliptical ovate, the second segment occupying most of the surface. Marginal vein long, the stigmal quadrate to oval. *Antennæ 8-jointed,* without a ring-joint, the club solid; funicle 1 elongate but not as long as the club, the pedicel longer than the body of the scape (genotype) or smaller (*hillmeadia*). Substigmal spot distinct.

From one female, Glenndale, Md. Type: Catalogue no. 20319, U. S. N. M., the female on a tag, the antennæ on a slide. Differs from the genotype mainly in the general coloration. Two more specimens, the same place, two weeks later.

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STUDIES IN THE OLD TESTAMENT.

BY R. P. DOW, Brooklyn, N. Y.

I. THE VENGEFUL BROOD OF LILITH AND SAMAEL.

There are certain discrepancies in Genesis, more apparent than real, which have puzzled commentators in all ages, and of which early explanations differ radically from present ones adopted since it has become generally understood that Genesis is a compilation of earlier narratives, notably the Elohistic and Jahvistic. Dr. Briggs, of the Union Theological Seminary, has pointed out, too, that the form of Genesis is wholly poetical. This leads to a reasonable inference that if the text be regarded as dipping into allegory, one may arrive much more nearly at the truth.

A stumbling block which has puzzled almost every child at Sunday School, as well as adults, is that Adam, the first man, and Eve, the first woman, had two children grown to maturity and both these sons had no difficulty whatever in finding human wives. Whom and whence? In the efforts to explain one encounters an earlier apparent discrepancy. In Genesis 1 it is stated that after the earth, sea and sky had been separated, after the stars were set, after grass and herbs were grown, after whales, fowl, cattle and creeping things, "God created man in his own image—male and female created he them. God said unto them, be fruitful and multiply."* After this a Garden of Eden was created. Trees grew up to fruitfulness, "pleasant to the sight and good for food." In ordinary nature this process would take some years, as a minimum. Still later (perhaps many centuries), Adam, described as created out of dust, "gave names to all cattle, fowls, beasts, but for Adam was not found an helpmeet for him." So God took one of his ribs, made a woman. This was Eve. To account for a population from which Cain and Seth got wives, later commentators claim that early commentators seized upon an Assyrian divinity and made her Adam's first wife. This was Lilith, who subsequently appears as mothering a brood of *zebub,* or flies. A second brood of children attributed to her were *Succubæ,* or devils which normally assume the female human form.

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* In this and all other quotations the King James version is used, unless otherwise stated.

All mythology begins from a basis of fact. All myths, all demi-gods, all gods (except alone the *Monotheos,* amorphous, infinite) are the imperfect recollections, distorted by ages of tradition, of living humans. Zeus and Hera upon Olympus, Thor and Baldur, Beelzebub and Lilith were human as ourselves.

Whence came Lilith is only partially recorded. There is authority for regarding her as blonde, or, as Dante Gabriel Rossetti paraphrases, "with hair of ropes of gold." If so, she would be Aryan, a predecessor of races of which the best known at present are the blue-eyed Scandinavians. The earliest extant account of Lilith is that in the Apocryphal Book, the alphabet of Ben Sira, dating perhaps from the tenth century A. D. Of course, this is no criterion of antiquity. It may be observed, parenthetically, that there was a great cult in southern Europe in the seventh century of Lilith worshippers, just as demon worship has spasmodically broken out in almost every century in some quarter. It may be observed, parenthetically, too, that the oldest existing manuscript of the Old Testament dates from the twelfth century A. D., although it is known from allusions long before Christ. One cannot judge from manuscript the age of any of the great books of Hebrew literature. Ben Sira states that Lilith was beautiful, with wavy long black hair. At all events this woman was so beautiful, so towering in intellectual gifts that she was known everywhere around the place where Babylon later was, and came to be worshipped as a goddess. There is Rabbinical authority that Adam was as the Arab or Jewish races now are, brown-eyed; and that he was created (or born) with a brown beard hanging to his waist. Perhaps, after humans multiplied, as told in Genesis 1, Adam, first man, was prototype to head a great race, to become the child of destiny.

Life with Adam was not satisfactory. He claimed obedience, either of woman to man, or impersonally to the chosen of destiny. Lilith claimed equal rights, having been created out of the same clay, and at the same time. When she realized how hopelessly obstinate Adam was in his reactionary views, she reached a decision not unlike that of the end-of-the-nineteenth century Nora in Ibsen's "Doll's House." She flew out of Eden and away from Adam, who in her stead got Eve for his second wife, taken from his thirteenth rib on the right side.

Note that in all tradition Lilith is able to fly, and so was more easily able to bear a brood of winged children. Note, too, that in their endeavor to reconcile the conflicting Biblical stories, the ancient Oriental adepts created legendary prototypes of suffragists and "antis." Note, also, that Eve was quite the opposite in disposition, the type of absence of self will. She was dark, probably Ethiopian, like the later Queen of Sheba, who, marvelously beautiful, was probably negro. Eve served Adam with such fidelity and submissiveness that the poet declares she was a rib of his own body. Imagery can go no farther than this.

Lilith, having flown southward, met a certain Ba-al, married him, and settled in the valley of Jehannum.

Naturally, then, the loyal descendants of Adam could not speak too illy of this woman who abandoned Adam, and apparently originated divorce. Even Jehannum became accursed and the children of Israel were warned not to intermarry with this outcast posterity. The place developes into an abode of darkness, and further until, in the attempts to localize a Hell, it becomes one of the planes, Gehenna differing from Tophet. Similarly tradition has localized heaven in planes, the "seventh heaven" remaining as the highest attainable bliss. In the Mohammedan conception of Hell, Jehannum remains particularly the abode of reputationless women. Thus Lilith was consigned by tradition to consort only with devils.

The Phœnician whom Lilith married, and who shares her obloquy, is still recalled by name, Samael. The term Ba-al is

Phœnician. In the time of Lilith the Phœnicians may or may not have completed their migration overland from the lower Red Sea district to the coast of Palestine. At all events they presumably maintained trade routes by sea or caravan along the coast. A Ba-al is merely a leading man, a captain, governor, anybody above the rank and file. This particular Ba-al, Samael, is beyond much doubt the man who appears in the Old Testament as Baalzebub, and in the New Testament as Beelzebul. The word *zebul* is Phœnician adopted into Hebrew. It means radically any elevation of ground, big or small. In Phœnicia this man was presumably lord of a mountain. In Hebrew, where he was to be spoken of only with contempt, he becomes master of a dunghill. Commentators of all ages have not overlooked that a manure pile is the breeding place of flies. In the New Testament only Beelzebul appears as a devil, not easily differentiated from Satan. The word *zebub* is also Phœnician, but it is also Hebrew from Exodus downward. It is most frequently translated "flies," but quite probably includes all pestiferous insects. It occurs in four connections in the Old Testament, invariably as flies or the equivalent in other languages. There are the dead flies which cause the ointment to stink (Ecclesiastes) ; in Isaiah, "the Lord shall hiss for the fly that is in the uttermost part of the rivers of Egypt." For the references from Exodus one must await the paper on the Plague of *Arob*. Schindler's "Biblische Lexicon" defines *zebub* as winged insects including *Culex, Vespa, Œstrum,* and *Crabro*. Others define it more broadly to include terrible things such as lions, tigers and scorpions.

The earliest Biblical allusion to Beelzebub is in 2 Kings. Here he is the false god of Ekron, whom children of Israel ran to invoke, just as they frequently worshipped a golden calf or other false divinity, meriting the rebuke of the orthodox. Inasmuch as Beelzebub is to appear as a devil, with home in Hell, and, as in Greek mythology Acheron is the river flowing around the boundaries of Hades, one naturally wonders whether the resemblance between the two words is accidental, or whether the origin of the myths is not similar. There is a passage in Pliny, the Roman bibliographer of natural history, first century A. D., mentioning the Cyreneans (a Greek colony on Phœnician soil) invoking the god Achorem to kill the flies which were producing a pestilence. This certainly suggests a triple etymological connection—Ekron, Acheron, Achorem. For eighteen centuries, however, commentators have been in error on this passage, pointing out Zeus Apomuios and Hercules with similar epithet. True, one of the attributes of Zeus and Jupiter is as a successful driver away of flies. The monstrous Hercules had similar great power over insects. When he finally settled down to live in Sicily, the Cicadas disturbing his noon naps, he struck them all perpetually dumb for fifty miles around. Both gods were fly killers. Beelzebub was their natural father and protector. With their annoyance he hit back at his Hebrew detractors.

Two or more broods of children were born to Samael and Lilith. Tradition makes plenty of mention of the second, the female devils, which made Lilith a mediæval by-word, terror of women in childbirth, to be fought with amulets—an easier way than by righteous living. For the first brood there is more slender authority. Perhaps it was taken for granted that, as Beelzebub was father of flies, his wife Lilith must have been their mother. *Per contra,* if Lilith bore this brood of flies, Samael must have been the father, and hence his epithet. In very early Sanscrit authority a day each year was set apart for a festival for flies. They were fed and cajoled, not for themselves, but to placate the evil demon who fathered their existence. Compare also the Avestic account. Almost from the beginning the evil author of a half of existence brought into the world insects (translated as "wasps") "which are very death to the cattle and the fields." In all Egypt the wasp typified power of death over humanity (cf. BULL., April, 1916, testimony of the Tombs, p. 1 *et seq.*). It may be noticed that in Hebrew literature the wasp is just as deadly. Its name here is *tzir*. In Exodus, "I will send hornets before thee, which will drive out the Hivite." In Deuteronomy, "Moreover the Lord thy God will send the hornet among them, until they that are left and hide themselves from thee shall be destroyed." In Joshua, "And I send the hornet before you, which drave out from before you, even the two Kings of the Amorites." Even kings could not withstand the hornet of the Hebrews.

There should be noted, also, the similar Biblical conception of the bee. The word Deborah is often chosen as a Christian name with the idea that it typifies industry, frugality and beneficence. The Hebrews were well acquainted with honey, for one of the early promises was to lead them to "a land flowing with milk and honey"; but all mentions of the bee dwell upon its stinging end. In Deuteronomy, "The Amorites chased you as bees do." In Psalm CXVIII, "They (mine enemies) compassed me like bees." In Isaiah, predicting disaster to Judah, "And it shall come to pass in that day that the Lord shall hiss for the bee that is in the land of Assyria [home of Lilith?]. And they shall come and shall rest all of them in the desolate valleys, and in the holes of the rocks, and upon all thorns, and in all bushes." Thus it will be seen that Deborah signifies a vengeful beast whose sting is destruction.

In interpretation of the *deborah* of the riddle of Samson about the bees in the carcass of the lion there is no more renowned paper in entomology than that of the late Baron Osten Sacken on the Bugonia Myth, identifying this particular deborah with countless others as the once Palæarctic, now cosmopolitanly common Syrphid, *Eristalis tenax.*

The word Lilith is next to be consulted. The root *lilatû,* night or darkness, is not Hebrew, but is Assyrian. The Assyrian spelling for the woman is *Lilit* or *Lilu.* It is not necessarily a duplicated root, but probably is, the root being originally the monosyllable *li.* This seems to mean night, and the idea of night is from the darkened blueness of the sky. In Demonology Lilith always operates at night. Moreover throughout the East indigo and its dark color have etymologically gone hand in hand. *Lilang* or *lilak* are present Persian adjectives meaning dark blue. The Persian for indigo is *nil,* adjective *nilak.* The Sanscrit for dark blue is *nila,* and its noun, *nili,* is indigo. While there is no direct connection between Lilith and our familiar shrub, the lilac, no evidence that the flower was regarded sacred to that divinity, yet the root is the same. This flower is native to Assyria and thereabouts. In Persian it is variously called *lilaj, lilang,* or *lilanj.* In Ottoman Turkish it is *leilag* (authority W. W. Skeats), or as spelled at present, *leilaq*.* The flower was brought to Europe before the crusades, probably by the Venetians. In Spain it remains *lilac* or is Hispanized as *lila*. Skeats, Etymological Dictionary, gives Anglo-Saxon *lilie*, not the lily, but the lilac; but gives no context on which his statement is supported. An English book of 1715 gives *lilach*.

One would imagine the same root for the Latin *lilium*, originally the night flower. Thus it dates back before the Greek λείριον, the phonetic change from *l* to *r* being wholly in accord with law.

The word *lilith* occurs once in the Old Testament, the famous passage, Isaiah 34, 14: "The wild beast of the desert shall also meet with the wild beasts of the island, and the satyr shall cry to his fellow; the screech owl (*lilith*) also shall rest there, and find for herself a place of rest." Whether or not we accept the translation of the King James version, the horns of a dilemma remain—did the woman give the name to the bird, or did the bird, always of ill omen, furnish the name for the despised woman? Apparently the former. The translation as screech owl has been bitterly assailed, although it has the support of the Septuagint. The King James translators found themselves in a quandary for words to account for several owls and other birds. There was a *cos* of Leviticus, for which big owl seemed a feasible rendering. The other owls appear, one in this very passage of Isaiah. There are *tinshemeth* and *yamshuph*, for one horned owl being suggested (with marginal note of swan). The names of animals in the whole passage must be dubious in any translation, for they include unicorns, bullocks, cormorants (margin—pelican), bittern, owls, ravens, dragons, satyrs, great owls, and vultures. St. Jerome, following Symmachus, departed from precedent and took the word *lamia*, a name applied to a bird only in this place. The familiar Latin name for owl is *noctua*, which Linné appropriated for the owl moths, insects whose luminous eyes and heavy color render them excellent miniatures of the bird. In Horace, Appuleius and Tertullian Lamia is a witch delighting in sucking children's blood, and so is not unlike the whole conception of

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* The popular Oriental names of women, Leila and Lillah, seem to have this root.

Lilith. In the margin of the King James version the words "night monster" are suggested instead of screech owl, and this change was adopted in the Revised version. It was supported and probably originally suggested by several of the more scholarly mediæval Rabbis. This is quite in keeping with Lilith, also, coming from men best acquainted with the Lilith tradition and at a time when it held strongest sway over men's minds.

In Mohammedan countries where story telling is highly developed the Lilith myth has assumed many forms. Not the least interesting is one which Fitz Nigle quotes in the N. Y. Tribune as having obtained from his Egyptian guide.

"It was said she was formed in beauty's mould with clay let down from heaven and to Adam joined on the side by a ligament like the Siamese twins, but that they quarrelled, so that the Lord cut them in twain with a flaming sword, and Lilith with her daughter, the fair Zelinda, wandered off to the land of Nod, where later on she became a witch-cat, while in the meantime Cain, as is mentioned in the Scriptures, went out into the land of Nod and took a wife—namely, Lilith's daughter.

"In regard to Eve, Adam's second wife, the legend states that a short time thereafter a pimple grew on Adam's leg, which attained a very great size, and one day, when he scratched it, out popped Eve, who quickly grew to womanhood and was married to Adam. In the meantime the devil was watching proceedings, and asked Eve if she knew that Adam had had another wife, and she replied that she suspected that her husband had not told her about his past life. Then the devil asked her if she would like to get even with him and she replied in the affirmative. Then he told her to go into the garden and pick some of the grain which the Lord told them they should not eat and give it to Adam, which she did, and when they, as the Bible states, fell from their high estate and were banished from the garden the Lord gave Eve a couple of cats to comfort her in her affliction.

"Later on it is said that these cats were the ones which Noah intended to take in the ark, but his wife, the unbelieving Norida, who hated cats, protested against it. However, he insisted, and as they were walking up the gangplank his wife suddenly pulled it in and threw them down into the water, which was boiling hot, and the cats were thus destroyed. But after the ark had been at sea a few weeks the rats and mice began to eat the grain, and Noah prayed for help, when the Lord caused the lion, which lay sick with a fever, to sneeze from out its nostrils a pair of cats, which soon destroyed the rodents, thus making them the most popular animals aboard the ship.

"Furthermore, when they landed on Mount Ararat and started with the other animals to travel to the Plains of Shinar the cats were given the head of the procession, and when they arrived there, and the people were building the Tower of Babel and the Lord confused their tongues, the voice of the cat, which heretofore had been sweet and melodious, was changed into its present raucous caterwauling."

A BIBLIOGRAPHY OF LILITH.

By A. S. Freidus, New York Public Library.

Long before Lilith entered the field of Jewish folk-lore she was a prominent figure in Assyro-Babylonian demonology. The etymology of the name given in the Encyclopædia Britannica: "Hebrew, *lilatu,* night" should have "Assyrian" substituted for "Hebrew."

In order adequately to follow Lilith's long career through the ages, from the dawn of religious belief to the present day, the following three principal lines of study suggest themselves:

1. Lilith in Babylonia, her home-land.
2. Lilith among the Jews.
3. Lilith in modern literature.

1. The Original Lilith of Babylonia.

To acquaint oneself with the rôle played by Lilith in ancient Babylonia, one should turn to the works of Reginald Campbell Thompson, formerly assistant professor of Semitic lagnuages at the University of Chicago, now residing at Oxford, England. Although a comparatively young man, he is the most prominent writer on the demonology of the Babylonians; he gives in his writings due prominence to the activities of Lilith; and he does not neglect to give the necessary references to the literature of his subject. He has written: The devils and evil spirits of Babylonia, being Babylonian and Assyrian incantations, London, 1903-1904, 2 v.; Semitic magic, its origin and development, London, 1908; and the Assyro-Babylonian part of the composite article "Demons and spirits" in James Hastings's Encyclopædia of Religion and Ethics, v. 4, 1912. He is now engaged in writing a book on Semitic mythology, which is to form v. 5 of "The Mythology of all Races," now being published in Boston under the editorship of Louis H. Gray.

In connection with this it may be said that the above-mentioned article in the Encyclopædia of Religion and Ethics relating to the demonology of the various nations, written by several specialists, and comprising over seventy quarto pages, contains a mass of material too valuable to be overlooked by any student of the subject.

2. Lilith among the Jews.

This includes the study of the passage in the Book of Isaiah XXXIV, 14, the numerous passages in the Talmud and the Midrashim, the Kabbalah, the various superstitions, and especially the amulets, that have survived to the present day.

On the Jewish side the most prominent writer in this line is the Hungarian scholar, Ludwig Blau. He is the Rector of the Jewish Theological Seminary at Budapest, the president of the folk-lore section of the Jewish-Hungarian Literary Society, and the author of a German work on Jewish magic ("Das altjüdische Zauberwesen," Strassburg, 1898). He has written the article "Lilith" in the Jewish Encyclopædia (v. 8, 1904) as well as the cognate articles: "Abraxas," "Amulets," "Augury," "Death, Angel of," "Exorcism," "Incantation," "Liver," "Magic," "Metatron," "Necromancy," "Samael," "Sandalfon," "Satan," and "Shi'ur Komah." (Compare also the following articles, written by other writers in the same work: "Asmodeus," "Azazel," "Bibliomancy," "Childbirth," "Demonology," "Divination," "Folklore," "Superstition," and "Witchcraft.") Compare Joseph Jacobs's "The Jewish Encyclopedia: a guide to its contents, an aid to its use," New York, 1910, "Mysticism" (p. 72–75). The articles "Childbirth" and "Amulets" in a way supplement the article "Lilith," as it is at childbirth that she displays her most pernicious activity, and many of the amulets are worn as a protection against her evil machinations at all times, but at childbirth especially. Women in that condition are exposed to attacks from many quarters. According to the Rabbis of the Talmud women die in childbirth to atone for their neglect of certain religious duties, the heavenly authorities taking advantage of that dangerous period and using it against the delinquents as a day of reckoning (Sabbath 32a). In all these articles the principal passages of the Talmud and the Midrashim, and sometimes also those from the Kabbalah, relevant to the respective subjects, are referred to, if not cited in full; whilst the references appended at the end indicate the studies of modern Hebraists and folklorists relating to the same topics. These references may serve as a nucleus for the desired bibliography of the subject.

The following few additional titles are offered as a contribution to the same:

Baring-Gould, Sabine. Legends of Old Testament Characters. London, 1871, p. 20.

Ben Jehuda, Eliezer. Millon ha-Lashon ha-Ibrit, v. 5, p. 2671–72 [proof sheets, 1915, in possession of the author.]

Brück, Moses. Vom Amulette bei einer Woechnerin. (In his Rabinische Ceremonialgebraeuche. Breslau, 1837, p. 50–55)

Cheyne, Thomas Kelly. The Prophecies of Isaiah. 5th ed. N. Y., 1892, v. 1, p. 197–198.

Conway, Moncure Daniel. Lilith. (In his Demonology and Devil-lore. New York, 1879, v. 2, chapter IX.)

Ginzberg, Louis. The Legends of the Jews, v. 1, p. 65–66. Philadelphia, 1909.

Grünbaum, Max. Gesammelte Aufsätze zur Sprach- und Sagenkunde. Berlin, 1901, p. 94–95.

Hundt von Radowsky, Hartwig. Die Judenschule. London, 1823, Buch 1, p. 121–123.

Krauss, Samuel. Victor Hugo. (Deborah, hrsg. von G. Deutsch, v. 2, p. 81–83. Cincinnati, 1902.)

Lévi, Israel. Lilit et Lilin. (Revue des Etudes juives, v. 68, p. 5–21. Paris, 1914.)

M'Clintock & Strong. Cyclopædia of Biblical, Theological and Ecclesiastical Literature, v. 9. N. Y., 1880, s. v. Screech-owl.)

Montgomery, James Allan. Aramaic Incantation Texts from Nippur. Phila., 1913.

Myer, Isaac. Qabbalah. Phila., 1888.

Natursagen. Hrsg. von Oskar Dähnhardt, Bd. 1, Sagen zum Alten Testament. Leipz., 1907.

Notes and Queries. 6 ser., v. 8, p. 248, 296, 354; v. 9, p. 5, 177. London, 1883–1884.

Stehelin, John Peter. The Traditions of the Jews, v. 2. London, 1742.

Waite, Arthur Edward. The Doctrine and Literature of the Kabbalah. London, 1902.

—— The Secret Doctrine in Israel: a Study of the Zohar and its Connections. London, 1913.

Waldaur, Adolf. Lilith. (Popilär-wissenschaftliche Monatsblätter, hrsg. von Adolf Brüll, v. 6, p. 248–250. Frankfurt a. M., 1886.

3. Lilith in Modern Literature.

It may be interesting bibliographically to find out to what extent this legend was known among Occidentals and how much use was made of it in modern literature. Such a compilation may be an interesting piece of work, especially since no attempt seems ever to have been made in this direction.

The following are a few examples of poetic renderings of the legend or of casual references to it:

Burton, Robert. Anatomy of Melancholy, 1621, first partition, section 2, member 1, subsection 2. A digression on the nature of spirits.

Goethe. Faust, 1808, Walpurgisnacht, at the end. Compare Bayard Taylor's translation, note 141. The passage is also found in Shelley's Scenes from the Faust of Goethe.

Belloy, Marquis Auguste de. Lilith, poème. 1885. (Not in the New York Public Library. There is an account of it in Larousse.)

Longfellow. Christus: a Mystery. Part I, The Divine Tragedy. The second Passover. (In his Poetical Works, Riverside edition, v. 5.)

Rossetti, Dante Gabriel. Lilith. [A sonnet, and a picture.] Compare Lafacadio Hearn, Appreciations of poetry, New York, 1916, p. 97–98. Rosetti also refers to Lilith in his poem Eden Bower.

Browning, Robert. Adam, Lilith, and Eve. [A poem.] (In his Jocoseria, 1883.) Also refers to Lilith in his poem "Two camels."

Collier, Ada Langworthy. Lilith: The Legend of the First Woman. [A poem.] Boston, 1885.

Perez, Isaac Loeb. Monisch. [A ballad in Yiddish.] 1888 (in his Schriften).

Jehoash. Die geganwete Callah. [A ballad in Yiddish.] (In his Gesammelte Lieder. New York, 1907, p. 80–82.)

—— Die böse Chaliastre. [A ballad in Yiddish.] 1908. (In his Neue Schriften, v. 1, page 68–71. New York, 1910.)

A few works of imaginative literature relating to modern life in which the heroine is named Lilith to indicate her partaking more or less of the characteristics of the original mystical personage.

Burr, Amelia Josephine. Lilith. [A poem.] (Scribner's Magazine, v. 47, p. 588. New York, 1910.)

Cahan, Jacob. Lilith. [A poem in Hebrew.] (In his Shirim. Odessa, 1913, p. 98–99.)

Catherwood, Mary Hartwell. Lilith. [A story. Illustrated.] (Lippincott's Magazine, v. 27. Philadelphia, 1881.)

Clemens, S. L. (Mark Twain). Eve's Diary. Extracts from Adam's Diary. New York, 1914.

Corelli, Marie. The Soul of Lilith. 3 v. London, 1892.

France, Anatole. La fille de Lilith. [A story.] (In his Balthasar, Paris, 1889. 10th edition. Paris, 1901.)

—— The Daughter of Lilith. [A story.] (In his Balthasar. A translation by Mrs. John Lane. London, 1909, p. 57–78.)

German, Juliusz. Lilith. [A symbolic play in Polish, in three acts and in verse.] Lwów, 1905.

Ginzburg, Pesach. Lilith. [A poem in Hebrew.] (Ha-Shiloah, v. 30, p. 342. Odessa, 1914.)

Keats, John. Lamia. 1819. "Lamia" is used as the equivalent of the Hebrew word "Lilith" (Isaiah xxxiv, 14), both by Symmachus in his Greek translation and by St. Jerome in his Latin translation.

Kurz, Isolde. Die Kinder der Lilith. Ein Gedicht. Stuttgart, 1908.

Macdonald, George. Lilith, a Romance. New York, 1895.

Pollock, Walter Herris. Lilith. [A story.] (Temple Bar, v. 43. London, 1874–1875.)

Wedde, Johannes. Lilith. Gesaenge. Hamburg, 1910.

Wilcox, Ella Wheeler. The Birth of Jealousy. [A poem.] In her world voices. New York, 1916, p. 110.

PREDACEOUS HABIT IN MADETERUS AND PSILOPA (DIPT.).

By J. R. Malloch, Urbana, Ill.

The larvæ of *Madeterus* have long been known as predaceous enemies of other insect larvæ, and though I have long suspected that the imagines have also the predaceous habit I was unable until July of last year to verify that suspicion. I can now record the fact that flies of this genus feed upon small insects, having taken a specimen in the act of devouring a male *Forcipomyia* (Ceratopogonidæ).

The species of *Psilopa* frequent foliage and are not uncommon upon flowers, especially milkweed, and I had not strongly suspected them of predacity. I observed this year one specimen suddenly attacked a small insect which it just as suddenly dropped. Examination proved the discarded prey to belong to the Thysanoptera and probably to be the common Thrips occurring on dandelion. I do not know why the insect was dropped but presume it was distasteful to the predator. In this connection it may be pertinent to mention that I have seen *Scatophaga furcata* pounce on and instantly discard specimens of *Anthocoris,* a bug having a most disagreeable odor. The small Thrips above mentioned is able to bite persons, as I know from experience.

THE NORTH AMERICAN SPECIES OF EUCHRYSIA. FEMALES.

By A. A. Girault, Glenndale, Md.

Based on the types.

Propodeum with a broad median area which is rugulose (distinctly more coarsely so in *similis;* not so in *maculipennis*), terminates in a line of large foveæ distad and which is distinctly wider than the scaly space between it and the lateral carina. Head and thorax densely, closely punctate, the abdomen finely scaly, segment 2 glabrous.

I. Wings hyaline or subhyaline. Postmarginal vein longer than the marginal.

Antennæ black with funicles 2–5 reddish brown; cephalic femora slightly swollen. Wings hyaline. Antennæ about as in *similis.* *hyalinipennis* Ashmead.

II. Wings with a large, ovate fuscous blotch from the marginal vein or uniformly infuscated from the base of the marginal vein to the apex.

Wings infuscated from the base of the marginal vein to apex. Postmarginal vein longer than the marginal.

Antennæ all black; cephalic femora much swollen. Funicle joints unequal, 2 largest, twice longer than wide, the club apparently 4-jointed with a lateral terminal spine which is curved at apex and hairy..............*similis* new species.

Wings with a large, ovate fuscous area against the marginal vein. Postmarginal vein distinctly shorter than the marginal.

Funicle joints all wider than long, widening distad; club solid, obliquely truncate, with no terminal spine. Segment 2 of abdomen occupying over a third of the surface. Mandibles tridentate. Cephalic femora a little swollen. Propodeum tricarinate at the meson, the space occupied by the carinæ barely wider than the space between them and the lateral carina (male)..............*maculipennis* Ashmead.

Euchrysia similis Girault. Female:—Like *hyalinipennis* except as described above. One ♀ in the U. S. Nat. Museum from Lawrence, Kan., June 18, 1896 (Hugo Kahl).

Type.—Catalogue No. 20,464, U. S. N. M., the specimen minutien-mounted, a fore and hind leg and an antenna on a slide with the type appendages of *hyalinipennis.*

THE ELEVENTH PLEOCOMA.

By H. C. Fall, Pasadena, Cal.

Pleocoma badia n. sp.—Form robust, nearly as in *fimbriata* and *conjungens;* color brown both above and beneath, hairs of under surface yellowish brown. Antennæ with the third joint elongate, fourth either with a short lamellate process or merely angulate, fifth to eleventh with long lamellæ, that of the fifth joint distinctly shorter than those following. Clypeus deeply notched, vertical horn emarginate at tip. Prothorax twice as wide as long, form as in *conjungens,* antero-medial area flattened and medially impressed or concave, surface finely, rather sparsely punctate, the flattened and impressed area conspicuously more coarsely and densely so and with numerous long hairs anteriorly. Elytra still more finely and sparsely punctate than the prothorax, the geminate lines only feebly defined.

Length 26–28.5 mm., width 14.5–15 mm.

Described from three males given me by my young friend Alonzo Davis, of Pasadena, who took them December 19, 1914, at an elevation of about 3,000 feet on the Mt. Wilson trail (So. Cal.), and who has recently published an account of their capture in this Bulletin (February, 1916).

At the time of receiving the specimens, a brief reference to Horn's synoptic table showed clearly that the only possible previously described species to which they could be referred was *conjungens* Horn. A difference of some four hundred miles in habitat is practically a guarantee of specific distinctness in this genus, but as *conjungens* was not represented in my collection I thought best to wait until I could compare with the type of the latter before going further. This I had the satisfaction of doing this past summer, and although the two forms are closely allied, I believe them to be quite distinct. As for the differences: First of all, *conjungens* is a black species, and *badia* is brown. All three examples of the latter are alike, and the color is in no way due to immaturity. *Badia* is sensibly larger—length 26–28.5 mm., *conjungens* 23 mm. The antennæ are of the same type, but the lamella of the fifth joint is nearly as long as those immediately following in *conjungens,* distinctly shorter in *badia.* In *badia* the thorax is hairy at the middle in front, in *conjugens* it is entirely destitute of hairs. The punctures of the flattened and impressed antero-medial area are more conspicuously coarser than those of the rest of the surface in *badia,* and the geminate striæ of the elytra are feebly defined; in *conjungens* the geminate striæ are quite distinct.

It is of interest to note that the point on the Mt. Wilson trail where *badia* was found is scarcely five miles west of the little cañon in which *P. australis* was discovered a few years ago. These two species by their antennal differences belong to different sections of the genus.

SYNOPSIS OF THE SPECIES OF ARTHROMACRA.

By Charles W. Leng, West New Brighton, N. Y.

In the fall of 1915, Mr. Wm. T. Davis and I spent a week in Washington, making daily visits to the U. S. National Museum and learning more from our intercourse with Mr. E. A. Schwarz and Mr. H. S. Barber than can readily be prepared for publication. The following remarks will however record one of the subjects that was thus brought out.

In consequence of the description of *Arthromacra robinsoni*[1] Mr. Schwarz called my attention to certain specimens in the U. S. National Museum remarkable for their vestiture of long thin hairs, collected by the late Hugo Soltau at Nashville, Tenn., which evidently represent a new species. In searching for additional material I found one more of the Nashville specimens in the Joutel collection, and representatives of still another new species in the American Museum, collected by Wm. Beutenmüller in the mountains of North Carolina. The remarkable elongation of the last joint of the male antennæ, characteristic of the Lagriidæ, is to be seen in these new species, varying in degree with each as in the species of the allied genus *Statira;* and variations in color, in the punctuation of the pronotum, and in the relative length and width accompany the more obvious characters first mentioned. It is interesting to note that the genus *Arthomacra,* widely distributed and known in our northern regions by the species *aenea* should have three species and two varieties near its southern limit as shown by the following synopsis.

Synopsis of the Species of Arthromacra.

Upper surface glabrous.
  Thorax distantly punctate; color brilliant green; last joint antennæ ♂ as long as six preceding joints combined; 11 mm.; Va. ....ROBINSONI.
  Thorax confluently punctate; color aeneous bronzed; last joint antennæ ♂ as long as three preceding joints combined; 12–14 mm.; N. E. U. S. and Can. AENEA.
Elytra with a few long, thin hairs.
  Thorax coarsely, confluently punctate; color bright green above, abdomen bronzed, tibiæ and tarsi testaceous; antennæ ♂ unknown; 10–11 mm.; Mts. of Va. and N. C. APPALACHIANA.
Upper surface of thorax and elytra clothed with long, thin hairs.
  Thorax coarsely punctate; color greenish or greenish coppery bronzed; abdomen darker, tibiæ and tarsi pale; last joint antennæ ♂ as long as five preceding joints combined; 11–12 mm.; Tenn. PILOSELLA.
  A. ROBINSONI Leng, Journ. N. Y. Ent. Soc., XXII, 1914, p. 285, fig. *a, b.*

Since recent studies have disclosed the presence of elytral hairs in two species of the genus I have reexamined my series of *robinsoni* and find in some specimens a few hairs near the apex of the elytra, not enough to cause any confusion with *appalach-*

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[1] Journal N. Y. Ent. Soc., XXII, 1914, p. 285.

iana. The latter moreover differs in the closer punctuation of the pronotum as well as in the male antennæ.

A. AENEA Say. Lang's Exped., II, 1824, p. 287; Horn, Trans. Am. Ent. Soc., XV, 1888, p. 28; Blatchley, Beetles of Indiana, 1910, p. 1284.

?donacioides Kirby, Fauna Bor. Am., IV, 1837, p. 239.
var. *glabricollis* Blatchley, l. c., p. 1285, fig. 570.
var. *rugosecollis* Leng, l. c., p. 287.

This species extends over Canada and our northern states from the Atlantic region to Minnesota and, in the mountains, it reaches Georgia. The thorax becomes less rugose in the variety *glabricollis,* described from Indiana, to which I refer with some doubt a specimen in the U. S. Nat. Mus. from Missouri, in which the legs are entirely red. Further collections from that region may show this to be representative of still another variety. In the variety *rugosecollis,* described from the mountains of Georgia, the greatest length, as well as the greatest development of the transverse rugæ of the pronotum, is attained.

A. appalachiana n. sp.

Slender, parallel, slightly broader behind, shining green above, darker green beneath, abdomen bronzed, antennæ, tibiæ and tarsi testaceous. Antennæ ♀ with the last joint as long as the three preceding joints combined (♂ unknown); head coarsely, confluently punctate, thorax similarly punctate, both glabrous; elytra also coarsely, confluently punctate and with a few long, black, hairs. Beneath the surface is nearly impunctate, shining, except the closely punctate sidepieces of mesosternum.

Length, 10 to 11 mm.

Type in U. S. N. M. collection from Pennington Gap, Va., June 30 (Hubbard and Schwarz). Other specimens collected by Wm. Beutenmüller, Graybeard Mt., N. C., June 25, and Black Mts., N. C., June 20, are in Am. Mus. Coll. and my own.

A. pilosella n. sp.

Elongate, subcylindrical, slightly broader behind, greenish or greenish coppery bronzed, shining, antennæ, tibiæ and tarsi pale testaceous, abdomen dark bronzed. Upper surface of thorax and elytra clothed with long thin, dark hairs. Head and thorax coarsely punctate, punctures somewhat irregular towards base of thorax, elytra rugosely confluently punctate, body beneath equally shining, coarsely punctate, except abdomen, and thorax beneath. Antennæ ♂ with last joint about as long as the five preceding joints combined; ♀ with last joint about as long as the three preceding joints combined.

Length, 11 to 12 mm.

Types in U. S. N. M. collected at Nashville, Tenn., June 20 (H. Soltau); other specimens from the same locality and from Frankfort, Ky., May 7 (H. Soltau), are in the U. S. N. M., the Am. Mus. N. H., and my own collection.

A NEW SPECIES OF TINGID FROM NEW YORK.

By J. R. de la Torre Bueno, White Plains, N. Y.

Corythaica is a genus described by Stål to contain *Tingis monacha,* from Rio Janeiro, Brazil, described by him in 1860. At present it contains several species, all from tropical or subtropical regions. Van Duzee does not record any species from the United States, and it is interesting to present one from as far North as New York.

Corythaica bellula, n. sp. Hood curving downward over head, white with black keel down the middle, flanked by a single row of cells on each side, becoming two posteriorly; broad and rounded posteriorly; nervures dark (brown to black); keel of hood continuous with median keel of thorax, which is higher. Eyes globose, black. Antennæ thin, not as long as head and prothorax together; joint 3 longest, thinnest; joint 4 next in length, stoutest, fusiform, thickly set with setæ; joint 1 and 2 shortest, 1 stouter and longer than 2, nearly as stout as joint 4. Rostral groove closed anteriorly, walls interrupted at anterior coxæ, widest at posterior. Rostrum reaching posterior coxæ; joint 1 not visible, 2 longest, thin; 3 and 4 stoutest, subequal, apparently somewhat flattened, 4 black toward tip.

Prothorax tumid anteriorly, produced in a point posteriorly and covering scutellum, tricarinate, carinæ nearly parallel, median slightly higher; a median transverse groove before the middle; deeply punctured, punctures merging into cells in the posterior flattened part; explanate lateral margin extending from the anterior two-thirds of thorax, narrow, much reflexed, nearly erect, with a single row of areoles, white, nervures concolorous. Pleuræ reticulated to coxæ. Legs of nearly equal length, all femora slightly incrassate, tibiæ slender, both unarmed; coxæ large, globose.

Hemelytra (in macropterous) extending much beyond abdomen, costal membrane narrow, single-celled, cells growing larger posteriorly and merging into membrane. Costal area long, narrowing posteriorly, cells small, growing larger posteriorly and merging into membrane, nervures dark; discoidal area narrow apically, rounded posteriorly and meeting costal in an elevated suture, two fifths as long as the costal area from the insertion of the wings. Membrane long, extending from anterior extremity of wing to the apex, where it merges into the costal membrane and the costal area; discal cells small, marginal large, growing larger posteriorly; all reticulations more or less infuscate, except discal cells. A membrane extends downward from the hemelytra one cell deep around the abdomen and conforms to its outline.

Abdomen broadest at the second and third segments, tapering to a rounded extremity. Male genital segment blunt, as long as the 2 preceding segments together and provided with stout hooks; female segment narrower and with a median keel. Long., 2.2 mm.; lat., .9 mm.

The brachypterous form differs notably in size and shape, being not more than two thirds the length of the macropterous, the prothorax much reduced and flattened; the membrane is nearly absent and narrow; the general shape is oval; the hemelytral reticulations are also much smaller. In other particulars it conforms to the macropterous. Long., 1.9 mm.; lat., .9 mm.

While colors have been given in the body of this description it is in general terms; the general coloration ranges from a light grey, nearly white, through darker grey, and brownish to nearly black.

Type: Macropterous female, White Plains, June 26, 1910. Morphotype: Brachypterous male, same locality, Sept. 25, 1909. Paratypes: Six macropterous females, same locality, four same date as type, one Sept. 25, 1909, one June 30, 1912. Six brachypterous females, and six males, same dates as above, except one, Sept. 19, 1909.

This species has been taken in one place only, a sloping grassy meadow, going up from a rich marshy swale in a field, among fine low grasses much intermingled with moss, by sweeping close to the ground. On one occasion (June 26), some 150 were taken by Mr. C. E. Olsen and myself. The short and long-winged occur together, with the former greatly preponderating. The period of greatest abundance is apparently in June, but they have been taken in April, May, June, July, August and September.

CONCERNING GERRIS REMIGIS SAY.

By Chris. E. Oslen, Maspeth, L. I.

April 4 at Alpine, N. J., I collected seven specimens of this species for breeding. They fed readily on spiders of the family Theridiidæ, the only food I could get at the time. Later I tried a species of Drassidæ, but it was too powerful. The *Gerris* abandoned the attack and allowed the prey to escape. First copulation was observed April 11 among the four survivors, three having drowned. Four had gone to the bottom of the jar containing them. I laid one on a blotter to be pinned. A few hours later I found it moving its legs feebly. When it recovered I put it back in the aquarium. After a square meal it seemed as vigorous as ever.

Copulation was a sort of continuous process. April 19 I discovered five eggs on the side of the aquarium; next day two more deposited on a straw. The eggs were placed in a separate vessels for observation. The first young emerged in seventeen days, imperfectly developed, unable to expand, and it died next day by drowning. The next hatched May 8, and next day had its first meal, a *Drosophila ampelophila,* of which I had bred numbers for feeding. It was very amusing to watch the *Gerris* attack the prey much larger than itself. It would jump around from side to side, apparently looking for the best place for attack. It finally landed quickly as eye could follow, jumped away with equal rapidity, repeating a number of times, inserting its beak each time, the fly becoming weaker and finally offering no resistance.

May 15 first cast skin found floating. May 22 the second; and food hereafter was a small microlepidopteron. May 31 third exuvia; June 9 fourth; June 24 fifth and a perfect imago, wingless of wingless parents.

NOTES ON LUCANIDÆ.

By John W. Angell, New York.

Pseudolucanus mazama var. nov. **bicostatus:** Differs from the typical form of *mazama* by the more elongate elytra, which are markedly costate, the two costæ being broad and rather flat. The narrow form of *bicostatus* at once distinguishes this variety from others which show faint indications of costæ. Type one male in my collection given to me by Mr. R. P. Dow, from Ft. Wingate, N. M. (John Woodgate collector). Length 30 mm.

Platycerus pedicillaris vs. **thoracicus:** In Memoirs of the Coleoptera, V, p. 374, Col. Thos. L. Casey says: "After carefully reading the description of (*P.*) *pedicellaris* Mollenkamp, described from California (Ent. Zeit., V, 1911, p. 304), I am unable to find any notable difference between it and *P. thoracicus* Csy. It is highly probable, therefore, that it is a synonym of that species."

In this connection I should say that I have in my cabinet one of the original cotypes of *P. pedicellaris* Mollenkamp, sent to me by F. W. Nunenmacher, the collector, and two specimens of *P. thoracicus,* identified by Col. Casey himself, and the difference is very marked. *Thoracicus* is finely punctured, flat in body, and easily discernable as a member of the *quercus* group; while *P. pedicellaris* has elytra coarsely striate and is much stouter in body, resembling in general appearance *P. keeni* Csy. This, I think, indicates specific distinctness.

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Vol. XII APRIL, 1917 No. 2

BULLETIN

OF THE

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BULLETIN
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Vol. XII APRIL, 1917 No. 2

EXPERIENCES OF A COLLECTOR.

By Annie Trumbull Slosson.

Some time ago I wrote, for a religious weekly, an article entitled Human Nature Study. In it I told of various experiences of my own in botanical and entomological collecting. I received many letters after its publication asking if it was truth or fiction and expressing surprise that any one in our enlightened age could show such ignorance as I spoke of encountering. But I am confident that the audience I address now will believe all that I may say on this subject. They have "been there":

I am, as most of you know, an old woman, though still an enthusiastic and strenuous collector. So as I tramp over hill and plain in rough, appropriate costume, butterfly net in hand, poison bottles hanging at my leather belt, with big bag, holding knife, forceps and other essentials, I suppose I am an odd looking character to the average passerby. So I make allowances and am rarely stirred to anger even by rude or discourteous questions or remarks. For many years I was more interested in botany than in any other branch of natural history and met with many amusing experiences in that kind of collecting. But this is not the place for them, and I will confine myself to the bug adventures.

Every one of you insect collectors has been asked again and again as to what one might call the lucrativeness of your pursuit. "How much are you paid for your work?" "What firm do you work for?" "What will you pay me to help you?" These are questions familiar to every collector. That one can walk miles over rough roads, climb rugged heights, stand for hours in mud or water, blister one's hands stripping bark from trees or turning big stones and this *without pay,* does seem hard to believe, I admit it. For these questioners know nothing of our real earnings, our full reward for all pains and exertions. The question most often asked, in one form or another, is *why* we do these things. And it is so hard to explain that *why* in a way they can comprehend. Often I find, after I have made what I think is a plain, lucid explanation of an entomologist's aim, that I have utterly failed to give the listener the faintest idea of it all.

"How many insects have you at home yourself?" asked a sweet faced old lady who joined me one day on a wooded road in Vermont. And when I told her there were thousands in my collection she exclaimed—"How do you ever feed them all?" And I found she thought they were all kept alive as pets or companions. Yet she herself was of more than ordinary intelligence and knew so many, many things I had no knowledge of. For she told me in what year the first missionary was sent to Africa and added many details as to his own and later missionaries' work and success. She talked of the different religious denominations in Vermont and had statistics concerning the comparative numbers of Baptists, Methodists and Congregationalists at her tongue's end. And she was fully as ardent and enthusiastic in this field as I in my small sphere of interest. Surely, as St. Paul says, "There are diversities of gifts, but the same spirit." I am often asked, in my wanderings, if I am employed by government to do this thing. At a summer resort, where I have been year after year of late, I find it is generally thought by the waiters and other employes of the hotel that I am in the employ of the state government, with a large salary. In vain I deny this—they only think I am guarding a state secret. A very intelligent woman in the south, after watching me night after night capturing moths at the electric lights, said to me very courteously, "I think now I understand your purpose in this. You are trying to see if you can find two of these night-flyers exactly alike. It is like trying, as I used when a child, to match two leaves of ribbon-grass." I afterwards learned that the woman was a teacher. I hope she does not conduct a nature course. In my frequent visits to Mt. Washington and my long sojourns on the summit I heard more strange and uncomplimentary comments upon myself and my doings than I ever heard at a lower level. You who have been to that delightful spot know how bleak and rugged is its external appearance and how little suggestion of animal life is there. A butterfly on that peak would seem to the casual observer or summer tourist an incongruous thing, a miracle. So each day when the train crept up the mountain, laden with travellers, looking, very often for the first time, upon the strange peak covered with pile upon pile of huge rocks I, happily and harmlessly following my beloved pursuit below the platform, would hear such remarks as these:

"What in the world is that old woman about? What's she got in her hand?" "Oh, it's a butterfly-net! Did you *ever?*" "She must be crazy. Just think of a butterfly up here. Why do her folks let her do it?" "Let's ask in the house about her, they'll know." They did know and much of our good Miss Clarke's valuable time was spent in satisfying the curiosity of the "exertionists," as we call them up there, as to the manners and customs of the queer character they had seen. The "man with the hoe" was not half as well known up there as the "woman with the net." I tell you I know from experience how it feels to be considered "a rare alpine aberration."

"Come on, Ma," I once heard a sunburned youth say to a plain, homey old woman as I stood on the platform watching the tourists filling up the waiting train soon to start for the base. "Come, the cars is going d'rectly, we must get seats."

"Le'mme alone, John. Seems's if I hadn't seen all the sights yet. Let's see. I've got 'em writ down here," and she read from a crumpled scrap of paper: "Printin' office, Lizzie Bourne's grave stun, the Tip-over House and—there I ain't seen the old bug woman!" I did not introduce myself and nobody pointed me out. So the disappointed sight seer was dragged reluctantly to the train, her golden opportunity lost. "Excuse me, madam," said a tall Southerner of the Colonel Carter type, as he swung his hat from his head with an elaborate bow, when he met me at the edge of an orange grove in Florida one April day. "I venture to address you without an introduction as I see you are a taxidermist." Then, almost before I could recover my breath, quite lost from the shock of this unjust accusation, he added in a trembling voice with a suggestion of nearby tears, "my mother-in-law was one also." Later I found that the said connection by marriage was a studier of ants and their habits. So that her pursuits and my own were really more alike than if she had followed taxidermy as her mourning son-in-law had intimated. The term entomologist does not seem generally understood throughout good collecting regions. Several times, in New Hampshire, when I have owned to being one I have found it understood to mean a member of some religious denomination. As one very old man in Jackson said when I owned the soft impeachment, "Well, I dare say, it's a good enough belief, but, as for me, I'm an old fashioned Hardshell Baptist like my folks before me and I ain't no use for your new sects." I did not set the old man right—what was the use?—but left him standing in the road gazing sadly after me and doubtless wondering how an intelligent being could accept other creed than that of the Hardshell Baptists'! I was once "held up" in a sandy Florida road by a solemn little girl of nine or ten, and denounced to my face as a "cruel, wicked woman" for putting to death harmless insects. I can see her now, as I look back, with her old fashioned, pale, pinched little face looking into mine, her thin little hand with uplifted finger being shaken at me, as she called down judgment upon my head. Did any of you ever try to defend your taking so many lives when talking with one who thinks it a sort of cruelty-to-animals pursuit? I never tried harder than I did that day. I told the child how painlessly the insects died by my hand; how short their natural lives were at the best, and how apt they were to die violent deaths, from storm, attacks of birds, etc. But oh, the look of scorn on that small face as she listened, and when I paused she said calmly, "Just talk, talk!" and I felt smaller than one of the flea-beetles I had just been capturing. I learned later that the child's mother was a vegetarian, thought it wicked to kill or eat any animal or wear its skin, carrying her ideas into everything and going to violent extremes. Small wonder that her child should try to do missionary work in the same field.

But I have had many, many pleasant encounters while collecting; acquaintances, yes, even warm friendships have been formed through chance meetings on the road, by stream, or in the woods.

A courteous question as to my pursuit, an inquiry about a flower or tree, a sympathetic phrase about nature in one of its varied forms, such things as these have been the small beginnings of great things making life broader, happier.

MISCELLANEOUS NOTES ON COLEOPTERA.

By Edward A. Chapin.*

During the past year several interesting facts in regard to the feeding habits of various beetles were ascertained and some of them seem worthy of publication. All observations reported here were made in the vicinity of Springfield, Mass., during the spring and summer of 1916.

Late in the winter, a few twigs of *Rhus glabra* L. were collected and placed in jars in the laboratory. As the object of the experiment was to obtain clerids, it could not be considered a great success, as only three specimens of *Phyllobaenus dislocatus* Say appeared. This species was reported by Blackman,† from the twigs of *Pinus strobus* L. However, the longicorns *Liopus fascicularis* Harr. and *Psenocerus supernotatus* Say were very plentiful. A mention of the latter species from this plant was made by Dow.‡ The minute ipid, *Pityophthorus consimilis* Lec. was also very abundant in the wood, and it is probable that this species furnishes something toward the food supply of the clerid.

Numerous trips were made to the region along the railroad where carrion, such as fowls, pigeons, cats, etc., are often found and careful inspection of the remains usually produced good results, especially in the families Silphidæ, Staphylinidæ and Nitidulidæ. An attempt was made to tabulate the relative abundance of the species of the genus *Silpha*. For a period of about three weeks collections of the specimens were made over a restricted locality. On April 21, only the species *inæqualis* Fab. and *noveboracensis* Forst. were to be found but these were already present in considerable numbers. At the end of the period the count showed the following species: *S. noveboracensis* and *inæqualis* is about equal numbers, roughly 1400 in all; 15 specimens of *surinamensis* Fab. had been taken as well as six of *lapponica* Hbst. and about 20 *americana* L. The genus *Necrophorus* was not much in evidence at any time. *N. marginatus* Fab. leads the list with 16 specimens, *americanus* Oliv. following with two and *sayi* Lap. and *orbicollis* Say with one each.

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* Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

† N. Y. State College of Forestry, Vol. XVI, November, 1915, p. 53.

‡ Bull. Brooklyn Ent. Soc., Vol. XI, p. 20.

One dermestid, *D. talpinus* Mann., heretofore reported only as far east as Indiana* was taken in quite considerable numbers. Apparently the stock cars serve as the means of dispersal of this species, as it was not taken elsewhere than along the tracks.

The nearly cleaned skeleton of a gray squirrel, inspected on June 6, gave, among others, specimens of *Prionochæta opaca* Say, a silphid, and, clinging closely to the inside of the skull, was one specimen of *Phenolia grossa* Fab., one of our largest nitidulids.

Of the flowers that give the collector many forms of Coleoptera, those of *Ceanothus americana* L. seem the most prolific, and many species can be readily taken here although rare on the flowers of any other plant. For instance, *Mycterus scaber* Hald. is quite common in this region on *Ceanothus* but I have yet to take it elsewhere. The longicorns of the genera *Leptura, Strangalia* and *Typocerus* are always abundant on pleasant days and literally hoards of the smaller species of Mordellidæ can be swept from the heads of flowers. Occasionally a wanderer appears, as was the case on July 24, when three specimens of the southern *Copidita thoracica* Fab. were taken on a single plant. At the end of the season this proved to be an unique capture. The flowers of the different species of *Viburnum* are also good collecting places and among others, copulating specimens of *Molorchus bimaculatus* Say were taken on June 12. *Leptura ruficollis* Say is also not uncommon on the flowers of this shrub. Late in the spring, when the flowers of the skunk cabbage are past their prime, certain nitidulids, such as *Omosita colon* L. and *Glischrochilus* (*Ips*) *fasciatus* Oliv. are quite abundant in the hoods, apparently feeding on the pollen. The large mountain mint, *Pycnanthemum*

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* Blatchley, Coleoptera of Indiana, 1910.

incanum (L.) Michx. proves attractive to *Rhipiphorus limbatus* Fab., as well as to certain other forms which however do not show special preference to the Labiatæ.

During the summer eleven species of the family Cleridæ were taken, six species being of the genus *Hydnocera* Newm. With their food plants and dates, they are as follows: *H. pallipennis* Say (July 16–Sept. 16) on *Carya glabra* Spach., *C. alba* K. Koch., *Juglans cinerea* L. and *Platanus occidentalis* L.; *H. humeralis* Say (Aug. 1), *H. longicollis* Ziegl. (July 15–24), and *H. verticalis* Say (July 16–17), all from *Carya glabra* Spach., and *H. lecontei* Wolc. (June 14–15) was found on *Betula populifolia* Marsh and *Verbascum thapsus* L., although this species probably came from a nearby stand of *Carya glabra*. Of the other genera collected, one specimen of *Monophylla terminata* Say was taken from *Vitis labrusca* L. on July 15, and, from *Carya glabra,* three specimens of *Ellipotoma laticornis* Say (July 16–17) and one specimen of *Phyllobœnus dislocatus* Say on July 16. *Trichodes nutalli* Kirby was found between July 30 and August 4, on the flowers of *Taraxacum officinale* Weber, *Daucus carota* L., *Pycnanthemum incanum* (L.) Michx., and *Chrysanthemum leucanthemum* L. The remaining species, *Necrobia violacea* L. was uncommon under the almost cleared skeletons of hens.

An interesting incident bearing on the instincts of myrmecopilous Coleoptera came under my observation one afternoon while returning from a collecting trip. A large brown ant (species unknown) was dragging an apparently dead beetle across a path. Stooping to pick the pair up for examination, I was much surprised to have the beetle take immediate flight from my hand. This flight was arrested by the net and the beetle proved to be the well known myrmecophile, *Cremastochilus canaliculatus* Kirby. The abduction by the ant did not disturb the beetle nearly as much as the outside interference. The most interesting part of the whole affair is the fact that the ant was still clinging to the fore leg by its mandibles. I wonder if the beetle would have stopped as soon as possible and allowed the ant to resume the interrupted journey.

A NEW SERICOTHRIPS (THYSANOPTERA) FROM AFRICA.

By J. Douglas Hood, U. S. Biological Survey.

The following description of an interesting little species of thrips taken in Africa by Lieut. Arthur W. Jobbins-Pomeroy of the Nigeria Regiment has been in manuscript for nearly two years, and is published at this time, in advance of a more extensive paper on the species of the same region, for the reason that the insect is the first of its genus to be recorded from beyond the limits of the Holarctic faunal realm.

The writer is indebted to Lt.-Col. Sir David Prain, Director of the Royal Botanic Gardens at Kew, England, for securing the determination of the plants from which the types were collected.

Sericothrips occipitalis sp. nov. *Female* (*macropterous*).—Length about 0.9 mm. General color pale brownish yellow, with numerous, clearly defined, brown markings.

Head widest across eyes, about 1.8 times as wide as long; color pale brownish yellow, both above and below, with vertical region dark brown; cheeks straight, nearly parallel, about half the length of eyes; frontal costa with V-shaped notch; occipital line represented only by a heavy brown line behind ocelli; occiput prominently reticulate with fine, dark lines, which are more indistinct and transverse near eyes; ocellar area very finely and evenly transversely striate. Eyes prominent, protruding, about two thirds as long as head and nearly as wide as their interval. Ocelli of posterior pair rather widely separated, pigment red. Antennæ slender, about 3.5 times the length of head, of normal structure; segments 1 and 2 nearly colorless; 3–5 pale gray, the apex of 4 and the apical half of 5 slightly infuscate; 6–8 concolorous with apex of 5; segment 6 with two long, slender, pale sense-cones, one on the inner and one on the outer surface, attached nearly their entire length, thus forming two longitudinal pale lines; segment 5 with one oblique similar structure on inner ventral surface.

Prothorax a little longer than head and about twice as wide as long, lateral and posterior margins rounded, anterior margin very slightly and roundly emarginate; pronotum pale brownish yellow except for a large, sellate, brown blotch which is margined with a darker brown line and which occupies slightly more than the posterior half of the median two thirds, this blotch arcuately emarginate in front and with the sides parallel; coxae brown, femora and tibiæ yellowish, slightly infuscate laterally; pronotum exceedingly finely and closely and rather obscurely transversely striate with anastomosing lines in the area of the dark blotch, the lateral and anterior portions prominently reticulate like the occiput; bristles normal to the genus, there being one long closely appressed pair near the posterior angles. Pterothorax brown in general color, with a more or less distinct pale girdle just behind middle coxæ; mesoscutum about as closely striate as prothoracic blotch, the lines converging (as usual) to three points on posterior margin; metascutum nearly as closely longitudinally striate. Fore wings brown at extreme base, then with a narrow, white, transverse band, the remainder of wing brownish gray, slightly paler toward apex; nearly twice as wide just beyond scale as at middle, the greatest subbasal width (exclusive of scale) about one tenth the length of wing; costal margin with about 27 equidistant bristles, anterior vein with about 29, posterior vein (absent?) unarmed. Middle and hind legs pale yellow, shaded more or less distinctly with brownish around middle femora and tibiæ, coxæ brown.

Abdomen moderately stout, about 1.6 times the width of prothorax; segments 1–3 and 6 pale yellowish brown, 4 and 5 yellowish white, 7–9 dark brown, 10 yellow; a dark line extends across base of tergites 2–7, that on 7 being arcuate in median third instead of strictly transverse; posterior margins of segments produced at sides (and also at middle of apical segments) into long, slender spines; pubescence absent from most of median third of tergites 2–5, brown in color except on 4 and 5; segment 10 divided above in apical two fifths; bristles norman to the genus.

Measurements of paratype: Length 0.864 mm.; head, length 0.084 mm., width 0.150 mm.; prothorax, length 0.098 mm., width 0.200 mm.; pterothorax, width 0.252 mm.; fore wing, length 0.714 mm., width near base 0.068 mm., at middle 0.035 mm.; abdomen, width 0.328 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	25	37	63	55	44	52	10	13
Width (μ)	26	26	19	19	16	15	6	5

Total length of antenna 0.299 mm.

Male (*macropterous*).—Length about 0.8 mm. Color as in female except that abdominal segments 1–3 and 6–8 are dark brown and concolorous, 4 and 5 being white and 9 and 10 brown, fading to yellowish at apex; a dark, straight line extends across base of tergites 2–9; three pairs of minute black dots just basal to the transverse line of segments 2–8.

Measurement of allotype: Length 0.768 mm.; head, length 0.072 mm., width 0.150 mm.; prothorax, length 0.092 mm., width 0.192 mm.; pterothorax, width 0.228 mm.; fore wing, length 0.618 mm., width near base 0.054 mm., at middle 0.030 mm.; abdomen, width 0.198 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	24	36	57	51	42	50	10	13
Width (μ)	24	24	17	17	14	14	6	5

Total length of antenna 0.283 mm.

Described from 2 females and 1 male, taken by Arthur W. Jobbins-Pomeroy at Ibadan, southern Nigeria, January 11 and 14, 1915, on *Desmodium lasiocarpum* DC., *Andropogon tectorum* Schum. & Thonn., and *Bougainvillæa glabra* Choisy.

Though taken from three species of plants, the series is thoroughly homogeneous both in color and structure. The absence of a true occipital line and the reticulate sculpture of the whole occipital area are sufficient to distinguish it from all previously described species.

SYNCHLORA AVIDARIA N. SP.—(LEP., GEOMETRIDÆ).

By Richard F. Pearsall, Allaben, N. Y.

Size, wing shape and color very close to *S. denticulata* Walk.,—a clear, pale pea green, the costa of fore wings above and beneath is narrowly margined with white, sometimes tinged with rose at bases, and the denticulate, thread-like white lines crosssing both wings are precisely as in *denticulata*. Fringe green, whitened at outer edge; and between veins at base, a single white dot forming a partial marginal row. Abdomen above green, marked longitudinally at centre with a white line. Pure white below. Antennæ in ♂ pectinate at base, graduating to simple at apices, snow white above, the pectinations and beneath yellowish. On the ♀ simple. A broad white band on occiput covers their bases, and there is a narrower one in front above labrum. Front a dull brownish red, quite rosy in some fresh specimens, with a narrow red line often present, dividing the white occipital patch from the green collar. Beneath, the wings are silvery white with a greenish cast, without markings. The body and legs snow white, excepting the front femora which are green.

Type ♂ from Palmerlee, Cochise Co., Arizona (June), was taken many years ago by the late Henry W. Marsden, and is in the collection of the American Museum of Natural History in New York.

The allotype ♀ from Oracle, Arizona, June 30, 1904, came to me from Mr. E. J. Oslar, and is in the same collection. A paratype ♀ is from the same source, taken at Oracle on the same day.

The species here described I have had from Florida, Arizona and San Diego, Cal. It may easily be separated from *denticulata*, a southeastern species, which has the front green; and, in its western habitat, from *liquoraria* Gu., with its red front, by wing texture and its clear green color, not inclined to yellowish, as in the latter.

Herrick-Schaeffer described under the name of **albicostaria** a species from the West Indies, which for a long while I considered might be the same with this, but a close study of a specimen, which I think should bear his name, taken by the late J. A. Grossbeck at Curacoa, and others from Porto Rico through the kindness of Geo. B. Engelhardt, leads me to believe them quite distinct. Later, it may be possible to confirm this opinion by comparison of genitalic mounts.

A KEY TO THE NORTH AMERICAN GENERA OF CŒNOSIINÆ (DIPTERA, ANTHOMYIIDÆ).

By J. R. Malloch, Urbana, Ill.

The members of this subfamily may be distinguished from other anthomyiids by the following combination of characters:

Under-surface of scutellum bare; sternopleural bristles 3 in number, arranged almost invariably in a nearly equilateral triangle, if 4 are present the additional one is ventrad of the lower posterior one; hypopleura and pteropleura bare; anterior supra-alar bristle absent or very minute; eyes of both sexes separated by about one third the width of head; frontal cruciate bristles absent; sixth vein of wing usually incomplete, complete only in *Neochirosia*.

The early stages are but poorly represented in my material—the only 2 species I have reared being found in the larval stage under bark of fallen trees and in rotten wood.

The imagines of most, if not all, of the species are predaceous, feeding upon minute insects such as Chironomidae, Sciaridae, etc.

Key to Genera.

1. Sixth vein of wing extending to margin ....*Neochirosia*.
—. Sixth vein of wing discontinued considerably before margin ...... 2.
2. Frons much broader than long, distinctly narrowed anteriorly, inner margin of eye concave above, the width of either eye viewed from above not greater than half the width of frons ......*Schoenomyza*.
—. Frons at least as long as broad, usually very much longer, width of eye about equal to that of frons .... 3.

3. Mesonotum with 4 pairs of postsutural dorso-central bristles, *Tetramerinx.*
—. Mesonotum with at most 3 pairs of postsutural dorso-central bristles 4.
4. Arista with very long plumosity; abdomen in male with 5 dorsal segments visible .... *Pentacricia.*
—. Arista short-haired, pubescent, or bare; abdomen in male with 4 dorsal segments visible .... 5.
5. Frons much produced beyond anterior margin in eye, usually from one third to one half the length of eye; arista pubescent, much thickened on basal half; face receding towards mouth; last abdominal segment in female armed with chitinised hooks .... *Phyllogaster.*
—. Frons very slightly produced beyond anterior margin of eye; arista slender except at extreme base; face almost vertical in profile; last abdominal segment in female not armed with chitinised hooks .. 6.
6. Squamae small, subequal; male with large ventral subapical appendages .... *Hoplogaster.*
—. Squamae rather large, under scale much larger than upper ..*Coenosia.*

I consider that the minute distinctions between *Cœnosia, Caricea, Dexiopsis* and *Limnospila* are not sufficiently constant nor are they so evident that they can be depended upon as characters for the differentiation of genera. I therefore place all species of these so-called genera in *Cœnosia.*

Neochirosia gen. nov.—Generic characters: slender, closely resembling *Chirosia* in habitus. Eyes widely separated in both sexes, cruciate frontal bristles absent; orbital bristles long; antennæ shorter than face, third joint but little longer than second, rounded apically; arista almost bare, slender, swollen at immediate base; cheeks rather high, bristly on lower margin; proboscis fleshy. Anterior supra-alar bristle distinct, almost one third as long as posterior one; 4 pairs of postsutural dorso-centrals present; sternopleural bristles in an almost equilateral triangle. Abdomen slender, subcylindrical; basal segment distinct but short; hypopygium small, the ventral recurved processes chitinised, last ventral segment with a deep V-shaped central incision. Legs slender, strongly bristled; claws and pulvilli subequal in length. Sixth vein of wings complete, seventh extending almost to margin.

Neochirosia setiger sp. n.—Male and female: length 5 mm.; black, covered with slight but distinct pruinescence. Head with distinct silky yellowish white pile; palpi black; antennæ black. Thorax not vittate, slightly shining. Abdomen colored as thorax, without distinct markings. Legs black, tibiæ and tarsi yellowish testaceous. Squamæ gray. Halteres yellow. Wings slightly brownish, especially anteriorly.

Orbits exceeding anterior margin of eye about as far as width of third antennal joint; cheek about half as high as eye, the latter almost exactly circular in outline. Acrostichals 2-rowed; scutellum with a very long pair of bristles situated on disc beyond middle, a smaller pair proximad of these, and a very small pair at apex. Fore tibiæ with 2 bristles, one on the posterior surface near middle and another on anterior surface nearer to apex; mid tibiæ with 5 bristles, 2 on anterior, 2 on posterior, and 1 on antero-ventral surface, the upper bristles weakest; hind tibiæ with 6 bristles, 1 antero-ventral, 1 anterior, 2 antero-dorsal, and 2 postero-dorsal.

Type locality, White Heath, Ill., May 28 and 30, 1916.

I found this species rather scarce amongst undergrowth in a wood along the bank of the Sangamon River.

A NEW GENUS AND SPECIES OF ANTHOMYIIDÆ (DIPTERA).

By J. R. Malloch, Urbana, Ill.

The genus described herewith is readily separated from any other in the family except *Proboscimyia* and *Dolichoglossa* by the remarkably slender, elongate proboscis.

The genus *Proboscimyia* was described by Bigot in 1883.* In 1885† he redescribed, or rather more fully described, the same genus and species, altering the generic name to *Proboscidomyia,* the correct form, in my opinion. I retain the original form of the name. In neither description is there any mention made of the character of hairing of the arista, but as the genus is compared with *Anthomyia* we may assume that it was either short-haired or pubescent.

In 1897 Stein described *Dolichoglossa*‡ and compared it with *Hammomyia* and *Hylephila.* No mention is made of *Proboscimyia,* and judging from the descriptions of the two genera I consider that there is but little doubt they are synonymous.

The present genus differs from the foregoing in having the arista extremely long-haired. The species differs also in having the legs yellow.

Neohylemyia gen. nov. *Male.*—Eyes narrowly separated; frons slightly protruded anteriorly; antennæ as in *Hylemyia;* arista globose at base, very

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* Bull. Ent. Soc. France, p. xxx.

† Ann. Ent. Soc. France, p. 266.

‡ Berl. Ent. Zeitschr., Vol. 42, p. 230.

long plumed above and below; face protruded well beyond eyes, cheeks broad; palpi slender, directed forward, very slender; proboscis much elongated, its length equal to that of thorax. Thorax with three post-sutural dorso-centrals, three sternoplurals; under surface of scutellum with a few weak hairs. Fourth ventral segment of abdomen cleft almost to base. Hind tibiae with preapical dorsal bristle. Sixth vein of wing complete; third and fourth veins subparallel, the former bare at base. Calyptræ subequal.

Type, *Neohylemyia proboscidalis* sp. n.

Neohylemyia proboscidalis sp. n. *Male.*—Black, slightly shining. Head brown, frontal stripe opaque black-brown; orbits deep brown; when viewed from the side the orbits appear deep brown as far down as middle of third antennal joint, the lower portion, cheeks, and face being whitish pruinose; antennæ black; proboscis brown; palpi yellowish. Dorsum of thorax black-brown, slightly pruinose, indistinctly vittate; lateral margins and humeri distinctly gray pruinose; scutellum as disk of thorax. Abdomen dark brown, the surface with dense grayish pruinescence, and a median longitudinal black stripe which is rather irregular in outline. Legs yellow, fore femora slightly darkened above, tarsi fuscous. Wings clear, veins yellowish. Calyptræ whitish. Halteres yellow.

Eyes narrowly separated, frontal stripe complete, but very narrow on upper half; third antennal joint over three times as long as broad; basal joint of arista short and stout, extreme basal portion of terminal section much swollen, rays on base of arista about two thirds as long as arista; cheek twice as high as width of third antennal joint and one and a half times as high as length of facial orbits beyond eye when seen in profile; proboscis geniculated beyond insertion of palpi, entire length equal to that of thorax. Presutural acrostichals irregularly 2-rowed, slender and of moderate length. Abdomen subcylindrical; apices of segments with strong bristles on dorsum. Legs slender; fore tibiæ with two or three bristles on posterior surface, and a series of setulæ on apical third of antero-dorsal surface; mid femora with two or three long bristles on basal third of ventral surface and three or four shorter and stouter bristles on median third of antero-ventral surface; mid tibiæ with four bristles—two posterior, one postero-dorsal, and one antero-dorsal; hind femora with a complete series of strong bristles from base to apex on antero-ventral surface; hind tibiæ with six or seven bristles—two or three antero-ventral, two antero-dorsal, and two postero-dorsal, the first mentioned lowest in position, the last stronger than the others; claws and pulvilli long. Costal spine short; outer cross-vein bent.

Length 6 mm.

Type, Quincy, Ill., taken on sand-bar in Mississippi River (C. A. Hart).

The species has much the appearance of a small *Hylemyia,* but the proboscis is very much longer and more slender than in that genus.

NOTES ON A FEW EUCNEMIDÆ AND DESCRIPTIONS OF NEW ELATERIDAE.

By Chas. Schaeffer, Brooklyn, N. Y.

Family Eucnemidæ, **Microrrhagus oblitus** Bonv.—Dr. Horn in his "Monograph of the species of the families Eucnemidæ, etc." in Trans. Am. Ent. Soc., XII, p. 34, says that this species is unknown to him and remarks that it apparently more closely resembles *subsinuatus* than any other of our species. The last named has the pronotum without anti-scutellar carina and the median line impressed posteriorly while *oblita* has a distinct antescutellar carina and no median impressed line. Of the former species I have two specimens and of the latter three specimens which answer the descriptions very well. Specimens collected by Mr. Shoemaker in Maryland and Virginia, however, show that these two characters are not constant. Some specimens have the prothorax distinctly impressed posteriorly and a distinct antescutellar carina, in others the carina is represented by a smooth, short line, which sometimes is slightly elevated behind; the impressed line may be distinct, faint or absent. The two species otherwise agree so closely that I have scarcely a doubt that they are one variable species.

Microrrhagus imperfectus Lec.—This species is said to resemble *subsinuatus* from which it is distinguished by the form of the posterior supplementary and the juxta-sultural carina. A single specimen, which I refer somewhat doubtfully to this species, has the outer carina of the juxta-sutural sulcus very distinctly obliterated behind but the posterior supplementary carina is not short but extends nearly to the middle. The length of the posterior and often the anterior supplementary carina is variable as a moderately large series will show and if no other characters are present to separate *imperfectus* from *oblitus* and *subsinuatus* the two last become synonyms of *imperfectus*.

The same variation in the characters mentioned above are noticed in my four specimens of *audax*, but this species has a differently formed and more coarsely punctured prothorax than the above named species. The variation or rather abbreviation of the outer carina of the juxta-sutural sulcus is mentioned by Dr. Horn in *bonvouloiri*. Of this species I have two specimens which have this carina distinctly and somewhat suddenly obliterated behind, not differing otherwise from a specimen with entire carina.

Family Elateridæ.—**Drasterius thoracicus** n. sp. Moderately elongate; finely pubescent; color reddish brown, antennæ and legs paler; markings as in *dorsalis* (*elegans*)* and *amabilis*. Head black, moderately closely and not coarsely punctate. Antennæ note quite as long as head and prothorax. Prothorax about as long as wide; sides moderately arcuate in front; hind angles rather long and acute, not divergent and with an acute carina; surface moderately coarsely punctate, punctures well separated. Elytra about twice as long as prothorax; sides narrowed in front and behind; striæ distinctly impressed and with moderate punctures; intervals sparsely, somewhat granulately punctate. Prosternum rather sparsely punctate at middle, punctures coarser at sides and near base; side pieces more coarsely punctate than prosternum; the first four ventral segments not densely punctate, the punctures at sides coarser than at middle; last ventral segments rather densely punctate. Penultimate tarsal joint scarcely lobed beneath. Length 5 mm. Southern Illinois.

One specimen of this peculiar little species in the collection of the late Ottomar Dietz. It is readily distinguished from any of our species by having the sides of the elytra narrowed in front and behind, which gives the prothorax the appearance of being wider than the elythra though the prothorax is not wider than the elytra a little above middle.

Drasterius subornatus n. sp. Rufo-testaceous; antennæ, legs and palpi paler; elytra with a rather indistinct postscutellar darker cloud and a more or less undulated subapical black fascia; pronotum with a faint apical darker cloud, which is absent in some specimens. Pubescence grayish white and a little longer than in *dorsalis*. Head moderately coarsely, not densely punctate; antennæ a little longer than the head and prothorax, third joint a little longer than second and both slightly longer than fourth. Prothorax a little longer than wide; sides feebly arcuate, almost parallel behind; basal angles slightly divergent and carinate; punctuation moderately coarse and not very close, punctures nearly equal over the entire surface. Scutellum flat. Elytra about twice as long as prothorax; sides feebly arcuate; apices conjointly rounded; striæ at base scarcely impressed, punctures moderate; intervals flat and finely, sparsely punctate. Underside rather coarsely punctate, the first few abdominal segments more finely punctate, the punctures gradually becoming smaller towards apex. Fourth tarsal joint scarcely excavate above. Length 5.25 mm. Brownsville, Texas.

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* According to Champion, Biol. Cent. Am. Col., Vol. III, pt. 1, p. 365 (footnote), Say's *dorsalis* is wrongly placed as synonym of *elegans*. The latter is West Indian and distinct from the North American species.

The twenty-five specimens before me show very little variation, some specimens have the prothorax unicolorous, others have a faint, dark, apical cloud This species differs from *dorsalis,* besides the different markings, in being smaller, the punctuation of prothorax a little more dense and the surface more depressed; the last mentioned characters separate it also from *amabilis,* which, however, has the fourth tarsal joints rather more deeply excavated above than *subornatus* and *dorsalis.* From *livens.* which is also more depressed than *dorsalis* and *amabilis,* it differs besides other characters, in having a stronger punctuation of prothorax and elytral striæ.

Drasterius (Aeolus) nigriventris n. sp. Moderately elongate, rufo-testaceous, antennæ, palpi and legs paler; underside, except at sides, head, a broad median line on prothorax and sides more or less black; scutellum and suture near the latter a broad, oblique blotch, starting from humeri to about the second or third stria and a broad, subapical, undulated fascia, also black. Pubescence sparse and fine. Head rather coarsely punctate; antennæ nearly as long as head and prothorax, third joint a little longer than second, both together longer than fourth. Prothorax slightly longer than wide; sides slightly arcuate and feebly narrowing towards apex, hind angles feebly divergent and acutely carinate, carina moderately long, occupying nearly basal third; surface coarsely and moderately closely punctate at sides, the punctures finer at the middle. Elytra about twice as long as prothorax, sides arcuately narrowing from a little below middle, apex conjointly rounded; striæ moderately impressed, punctures of the first few striæ rather small and not closely placed, becoming larger and closer at sides; intervals flat, sparsely and finely punctate. Prosternum, metasternum and the first few ventral segments at sides coarsely punctate, the latter more finely punctate at middle. Fourth joint of tarsi slightly excavate above. Length 6 mm. Brownsville, Texas.

This species resembles superficially *amabilis* but has a larger and anteriorly less narrowed prothorax, less divergent hind angles with longer carina and sides more or less piceous; the underside, except at sides and apex is piceous or black. It seems to be allied to the Mexican *pulchellus* Caud. but that species has the carina of the hind angles about half of the length of the latter.

Drasterius (Aeolus) scutellatus n. sp. Similar in color and markings to *dorsalis* Say, but of slightly narrower form. Head rather coarsely and moderately closely punctate; antennæ about as long as head and prothorax, second and third joints together longer than fourth. Prothorax about as long as wide; sides moderately arcuate, gradually narrowing towards apex, hind angles slightly divergent with a moderately long, acute carina; surface rather coarsely and not very closely punctate, pubescence rather short and sparse. Scutellum conically raised in front. Elytra nearly twice as long as prothorax; sides scarcely arcuately to a little beyond middle, thence rather more arcuately to narrowing towards the conjointly rounded apices; striæ distinctly impressed and with close, moderate coarse punctures which are coarser towards the sides; intervals feebly convex, sparsely and rather finely punctate; surface sparsely clothed with short, gray hairs. Prosternum rather coarsely but not densely punctate, the punctures finer near apex; side pieces more densely punctate. Abdominal segments one to four, not densely punctate, the punctures coarser at sides than at middle, last segment finely and densely punctate towards apex. Fourth tarsal joint slightly excavated above. Length 7 (type)–5.5 mm. Brownsville, Texas.

This species differs from all our known N. Am. species in the conical raised scutellum. Small specimens resemble *amabilis* in form more than *dorsalis* but, besides the different form of scutellum, have longer carinæ of the hind angles of prothorax and coarser elytral striæ. It is evidently closely allied to the Mexican *circumscriptus* Champ. with which the description and figure agrees very well, except that the interstices are said to be roughly punctured in that species, which are in *scutellatus* rather finely punctured.

Megapenthes nigriceps Schaef.—In the material collected in Brownsville, Texas, by the late Ottomar Dietz I found a female of this species, which I described from a single male collected by myself. This female has the head not piceous or black but dark ferruginous behind and paler in front, otherwise it does not differ from the male except, as usual, in stouter form, shorter antennæ, etc.

Betarmon californicus n. sp. Antennæ, head, legs and underside, except side pieces of prosternum, base of elytra and a rather broad, but indefinite sutural stripe black or piceous; pronotum and side pieces of prosternum yellowish ferruginous and sides of elytra pale yellowish brown. Surface sparsely pubescent with short yellowish hairs. Head rather coarsely and densely punctate, front distinctly margined and arcuate. Prothorax slightly longer than wide; sides gradually converging from base of hind angles to a little above middle, then arcuately narrowing to apex; hind angles rather feebly diverging and not carinate; surface closely punctate with moderately coarse punctures. Elytra a little more than twice as long as prothorax, scarcely wider at base than prothorax a little above hind angles, gradually widening towards a little beyond middle, thence arcuately narrowing to apex, apices subtruncate; striæ scarcely impressed and with moderate, close, somewhat elongate punctures; intervals rather sparsely punctate and more or less transversely rugose. Prosternum shining, coarsely and closely punctate, side pieces rather dull and more densely punctate, with smaller punctures than at middle. Metasternum and abdomen not densely punctate with moderate punctures; coxal plates rather suddenly dilated inwards with the exterior angle rounded. Tarsi simple. Length 7 mm. Tulare Co., California.

This species, a single male, was in the material received by the late Ottomar Dietz from the above named locality and I am under the impression that I have seen other specimens of this species showing variation in the coloration of elytra, being either entirely piceous or with the dark sutural stripe narrower and the sides paler than in the type specimen.

B. bigeminatus Rand. our only other species differs from the above described species, besides coloration, in having distinctly and rather sharply carinated hind angles and shorter antennal joints. Both species, *bigeminatus* and *californicus* are not typical *Betarmon*. The third tarsal joint in the type species of the genus, the European *B. ferrugineus,* has the fourth tarsal joint very small, and the third dilated and with a small lobe, while in our species the tarsi are simple. In Genera Insectorum, Coleoptera, family Elateridæ. Otto Schwarz failed to list our *Betarmon bigeminatus*.

Oxygonus montanus n. sp. Form elongate, head and prothorax black, elytra blackish brown, first joint of antennæ and legs reddish. Head moderately coarsely and not densely punctate. Antennæ nearly as long as the head and prothorax, joint two shorter than third, fourth a little shorter than third and slightly longer than wide at apex, joints four to ten, about as long as wide and feebly serrate, joint eleven elongate oval and a little longer than the tenth. Prothorax about as long as wide, feebly narrowing towards apex, sides scarcely arcuate, hind angles acutely prolonged, moderately divergent and not carinate; surface with moderate and well separated punctures, which are a little coarser toward apex and finer near base; pubescence grayish white and longer than on elytra. Elytra as wide at base as the thorax; sides feebly arcuate and nearly parallel, narrowed and conjointly rounded near apex; surface with moderately impressed and not coarsely punctured striæ; intervals rather flat and not densely but confusedly punctate, covered rather sparsely with short grayish white hairs. Metasternum and abdomen rather finely, not densely punctate and covered with short grayish white hairs. Length 8.25 mm. Catskill Mts., Ulster Co., N. Y.

I have seen two specimens of this interesting little species, collected by Mr. Ernest Shoemaker, one of which he allowed me to retain for the Museum collection.

This species differs from *obesus* by its narrower and more elongate form, differently formed prothorax, relatively longer third antennal joint and lateral margin of elytra scarcely at all reflexed. It seems to be similar in form to the Californian *ater*, but that species is black, including legs, has the prothorax coarsely punctate with hind angles carinate, elytral intervals biseriately punctured and the body beneath deeply punctured.

A Year of Costa Rican Natural History. By Amelia Smith Calvert, Sometime Fellow in Biology, Bryn Mawr College, and Philip Powell Calvert, Professor of Zoology, University of Pennsylvania, Editor of Entomological News. With Maps and Illustrations. New York: The Macmillan Company. 1917.

The topography of this paper is all that may be desired and there are 577 pages, 141 plates and figures and a full-page frontispiece in color, also a general map of the country.

A greater interest is continually being taken in foreign countries by the tourist, the naturalist and the business man. Increased and more comfortable facilities for travel, in addition to speed, make such countries far more attainable. More persons at present are taking an interest in nature and the ordinary work of travel frequently gives scant treatment to the plants, mammals, birds, reptiles and insects of the country visited. While the present work gives ample description of the geography, topography, geology and climate, the greater part of the book is devoted to the living forms of life. It particularly treats of the insects and plants. The dragonflies, among the insects, receive the largest share of attention as one of the authors is an authority on these insects and many new facts were obtained as to their distribution, habits and life history. The whole work well repays perusal but there are some specially interesting chapters for the student of nature, among these being "Juan Vinas—The Waterfalls," in which valuable and new observations are made on the dragonfly, *Thaumatoneura.* Fascinating descriptions are given of the ascent of the volcanoes Irazu and Poas.

A thrilling chapter is entitled "Carthago Deleta Est" and must be read to be appreciated. The authors are to be congratulated that they were able to return alive and write the book. There are graphic accounts of the towns visited and descriptions of the people, their homes, government and fiestas. The illustrations are excellent and are nearly all from photographs taken by the authors. The appendices are very valuable to the student and show painstaking work in their compilation. They include the authors' itinerary, with notes on weather in places other than Cartago, Cartago weather records for a year, papers based in whole or in part on the collections made by the authors in Costa Rica, a list of selected literature relating chiefly to the natural history of Costa Rica, exclusive of that cited in appendix III, systematic list of plants and animals mentioned and a full index. This book shows extreme care in its preparation and is replete with valuable information on all the lines of which it treats. It will take high rank among the works of a similar character and will be most useful to the traveller or student of nature who visits that country in the future and will prove interesting reading to all those persons who would like to see the country but failing in that will appreciate such an excellent description of a large part of it.

H. S.

PROCEEDINGS OF THE BROOKLYN ENTOMOLOGICAL SOCIETY

Meeting of October 12, 1916.—Ten members and four visitors were present.

Dr. Felix Metzner was elected to membership.

The death of Mr. C. H. Roberts, a charter member of the Society and its Treasurer for 31 years was announced by the President, as well as that of Mr. L. H. Joutel, also a member for many years.

The scientific programme was a symposium on the collecting experiences of the past summer. Mr. Davis exhibited *Balaninus proboscideus* Fab., *B. baculi* Chitt., *B. rectus* Say, *B. nasicus* Say, and the Cicadas *Tibicen sayi,* and *Tibicen auletes* Germ., all from Rockaway Beach, on September 17. Many dragon flies were found cast ashore, among them the powerful flier *Apiaeschna heros* Fabr., found drowned. September 21, at Long Beach, two *Cicindela dorsalis* were taken, a late date for this insect, usual in July. *Catopsilia eubule* was taken flying rapidly in an easterly direction.

Mr. Bueno showed three specimens of *Stachyocnemus apicalis* taken on October 8 in a sand pit, and six *Fitchia aptera,* all wingless, found under a board. He had found collecting poor about White Plains in the past summer. Mr. Dow reported *Cincindela lepida* in countless numbers at Lahaway, N. J. Mr. Geo. Franck collected on the shores of the Gulf of Mexico, without result. Mr. Ballou reported a variety of *Trichius* received from Mr. Loding, from Beaufort, N. C. Mr. Engelhardt referred to his experiences on a trip to the Pacific Coast.

Dr. Forbes mentioned a species of *Alcis* (*Hesperumia*) *sulfuraria* from Peru, N. Y., near Plattsburg. *Smerinthus cerisyi* came to light and *Syneda alleni* was locally common.

Mr. Funaro reported *Cregya vetusta* from Rosedale, July 30. Mr. Weeks reported *Vanessa j-album* at Yaphank. Mr. Olsen showed a collection of local species of *Podisus* including types of his new species, *Podisus fretus.*

Meeting of November 16.—Fifteen members and one visitor present. Long Island records—Mr. Schott reported *Meadorus lateralis* from Wyandanch, September 17. Mr. Davis reported *Cicindela marginata* from Orient, L. I., August 15, taken by Mr. Roy Latham, reported from two other localities on the north shore of the island, Northport and Wading River. Mr. Doll reported *Scopelosoma devia* common on Long Island. The scientific programme was Mr. G. P. Englehardt's account of his visit to the Grand Canyon of Arizona, between June 6 and 10. After an illuminating description of the natural features he noted as interesting captures in the canyon of *Cicindela arizonæ,* rather common along a small stream on the Bright Angel trail; *Zopherus gracilis, Hetærina vulnerata,* abundant in Indian Garden, as well as *Notonecta mexicana; Memythrus cupressi* was found on willow, in the same place, and the larvæ of *Megathymus* sp. was found boring in agave. *Sphinx coloradus* came to light at the top of the Canyon.

Meeting of December 14.—Twelve members and one visitor present. Mr. Chas. A. Ballou was elected a member.

Long Island Records: Mr. Schott reported *Tornos scolopacinarius* from Flatbush, April 16, and Mr. Doll reported that Mr. J. C. Wright had the larvæ from Long Island. From the same locality, Mr. Schott also reported *Elater vitiosus,* not heretofore reported either from Long Island or New Jersey. Mr. Olsen, for Mr. Shott, reported *Aradus uniformis* from Wading River, May 30, 1915, and *A. acutus* from Wyandanch, June 16; *A. duzeei* from Nepera Park, above Yonkers, was also shown, taken May 21, 1916.

Under scientific programme Mr. Bueno spoke on the New York Scolopostethi, a Lygaeid genus, and showed the species likely to be found on Long Island, *Scolopostethus atlanticus, S. affinis* and *S. thomsoni, affinis* being taken in large numbers at the roots of bunch grass. The members of this genus in general appear to be dwellers in swales or marshes, or near them. Mr. G. P. Engelhardt spoke on his collecting experiences under the head "Notes from Southern California." He told of the beautiful things of nature he had seen in his excursions in California. Only a few of the insects taken were shown, the others not yet being ready. He commented on the great abundance of some of the butterflies, *i. e., Pyrameis carye, Lemonias virgulti, Coenonympha californica* and *Lycaena exilis.* Equally abundant also were *Pieris rapæ* and *Thecla melinus,* the first finding a suitable food plant in a wild mustard that grows in dense thickets to a height of ten feet or more and the latter on beans so extensively cultivated in southern California. Very common among the moths were *Apantesis proxima* var. *autholea* and *Ctenucha brunnea*. Many interesting forms of Noctuidæ and Geometridæ were shown.

Cychrus pyrsolepis Lec. in vol. XI, p. 90, and in Index should read *Adelocera pyrsolepis* Lec.

Sphinx chersis in vol. XL, p. 91, read "rarely taken of Long Island."

Cicindela strigosa, vol. XI, p. 92, and in Index: Read "*Cicindela striga,* captured by Jacob Doll, specimen now in the Brooklyn Museum."

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BULLETIN
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Vol. XII June, 1917 No. 3

THE NORTH AMERICAN SPECIES OF MONANTHIA (TINGIDÆ).

By Carl J. Drake, Ohio State University, Columbus, Ohio.

The genus *Monanthia,* established by Lepelletier et Serville in Encyclopedie Methodique, X, p. 653, 1825, is represented in North America by three species. The two tropical or semitropical species, *M. monotropida* Stål and *M. c-nigrum* Champion, are well characterized and illustrated by Champion in the Biologia Centrali-Americana (Rhynch., Vol. II, 1898) and the only Nearctic species, *M. labeculata,* was described by Uhler in North American Fauna, No. 7, 1893. Two new forms are added herein, one from Texas and the other from Colorado. I am indebted to Mr. Edmund Gibson, National Museum, Washington, D. C., who has very kindly sent me the description of *M. ehrethiæ* to be included in this paper.

Key to the North American Species of Monanthia.

1. Pronotal margins very broadly expanded, contiguous with the median carina .... 2.
   Pronotal margins not so broadly expanded .... 4.
2. Head armed with five long spines; pronotum with the center of each lobe strongly raised, ear-shaped; elytra with the posterior portion of the outer nervure closing discoidal area very strongly curved, forming a c-shaped mark .... **M. ehrethiæ Gibson, n. sp.**
   Head armed with three very short spines; pronotal lobes and the outer nervure closing discoidal area with no indication of the above structures .... 3.
3. Rather small insects, about 3 mm. long; costal area of the elytra uniseriate, the areolæ very small .... **M. labeculata Uhler.**

Larger insects, 3.5 mm. long; costal area uniseriate, but the areolæ very much larger ....**M. coloradensis** n. sp.

4. Lateral margins of the pronotum rather broad, occupying about two fifths of the entire width; elytra with the posterior portion of the outer nervure closing discoidal area very strongly curved, forming a c-shaped mark ....**M. c-nigrum** Champion.

Lateral margins of the pronotum very narrow, mostly uniseriate; the posterior portion of the outer nervure closing discoidal area not so strongly curved ....**M. monotropida** Stål.

Monanthia ehrethiæ Gibson, sp. nov.—General form of *M. c-nigrum* Champion, but readily distinguished from it by the much larger lobes of the pronotum and the irregularity of the areolæ along the costal margin of the elytra.

Head broad, armed with five long prominent spines, three frontal and two adpressed spines (the later spines arise near the base of the head and extend forward near the eyes). Antennæ with the basal segment slightly longer than the second; fourth segment swollen and as long as the first and second taken together. Bucculæ prominent; rostrum reaching to middle coxæ. Pronotum prominently lobate on each side, and coarsely reticulate in comparison to the reticulations of the corium; the center of each lobe raised, ear-shaped. Median carina extending the entire length of pronotum, on each side of which at the base is a short carina, diverging. Elytra very finely reticulate, with posterior portion of the prominent nervure closing the discoidal area forming a c-shaped mark. Reticulations towards the apex of the elytra becoming larger. Areolæ large, one row along costal margin of elytra but which is interrupted occasionally by smaller areolæ bordering the costal margin. A single row of large areolæ also bordering inner margin of membrane. Size: 2.7–3 mm. long; width of pronotum, 1 mm.

Color.—Head black, with spines whitish; first two and fourth segments of antennæ dark, the third testaceous. Rostrum testaceous, tinged with black at apex. Lobes of pronotum pale brown, darker on raised portions. Elytra ferrugineous, with the c-shaped mark and borders of areolæ darker. Beneath piceous, rostral groove testaceous. Tibiæ and apex of femora testaceous.

Described from three females and three males, collected by Mr. H. S. Barber in southern Texas from *Ehrethia elliptica* D. C. Besides these 25 other specimens have been examined which were collected by Messrs. Barber, C. H. T. Townsend, and E. A. Schwartz, at Brownsville and Victoria, Texas. *Ehrethia elliptica* is undoubtedly the food plant of this species as Mr. Barber has taken eggs and nymphs as well as adults from it and has observed the injury to the leaves caused by the feeding of both nymphs and adults.

Monanthia coloradensis sp. nov. (Fig. 1; *b*).—Form and color similar to that of *M. labeculata* Uhler, but considerably larger and more robust. Head short, with three blunt, very short, frontal spines. Bucculæ large, prominent, coarsely pitted, closed in front. Antennæ: basal segment strongly swollen, slightly curved outwards; second segment less swollen, slightly shorter than the first; third segment slenderest, nude, three times the length of the fourth; fourth segment swollen towards the apex, clothed with a few bristly hairs, longer than the first and second conjoined. Apex of rostrum concealed by the point upon which the insect is mounted. Pronotum tricarinate, the median carina extending the entire length of the prothorax, the lateral basal carinæ low, short, and diverging posteriorly; lateral margins broad, contiguous with the median carina. Elytra a little longer than the abdomen, finely reticulate; costal area rather broad, uniseriate, the areolæ much larger than in *labeculata;* subcostal area finely reticulate, with five rows of areolæ at the widest part; discoidal area extending slightly beyond the middle of the elytra, finely reticulate, with six rows of areolæ at the widest part, sutural area broad, the areolæ a little larger than in the discoidal area. Wings visible. Length, 3.5 mm.; width, 1.54 mm.

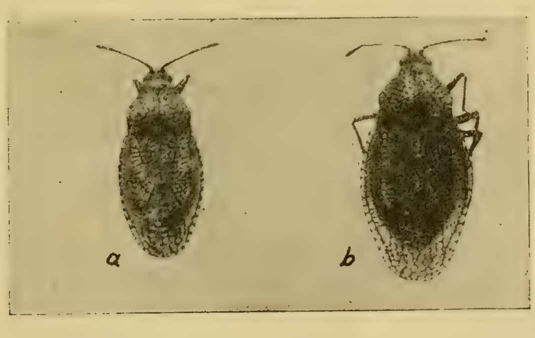

FIG. 1. *a, Monanthia labeculata* Uhler; *b, M. coloradensis* sp. nov. (Photo. by author.)

Color.—Pronotum and lateral margins and elytra testaceous, the nervures marked with brown and fuscous. Legs brown, the tips of tarsi fuscous. Antennæ: first and second segments fuscous; third testaceous; fourth blackish. Head and abdomen beneath piceous. Rostral sulcus, bucculæ, anterior margin of pronotum, and posterior margin of the pro- and metathoracic pleuræ margined with dirty white.

Described from a female specimen, collected in Colorado. It can readily be separated from *labeculata* by its larger size and the much larger areolæ of costal area of the elytra; the two species, *labeculata* and *coloradensis,* are equally enlarged in the photographs.

SYNOPSIS OF THE GENUS DASYLLIS (ASILIDÆ).

By Nathan Banks, Museum Comp. Zoölogy, Cambridge, Mass.

The species of *Dasyllis* are among the largest and most prominent of our Asilidæ. In appearance they resemble bumble bees; in the north where there are red-haired species of *Bombus* there are also red-haired species of *Dasyllis.* Their habits and manner of flight are, however, very different from that of the bumble bees, and they cannot be considered as true mimics of *Bombus,* but rather as members of a Müllerian association. Our species are fairly abundant and several undescribed, although I find by the collection in the Museum of Comparative Zoölogy that Loew had manuscript names for most of the forms. The species are more numerous in the east, but there are a number in the west coast region, few however in the Rocky Mountain region. The genus is North American, a few occurring in Central America; it is an offshoot of the holarctic genus *Laphria.*

Synopsis of Species.

1. Mystax gray; head, thorax, tip of abdomen, and legs with gray hair .... *cinerea* Back.
Mystax largely black, at least many black hairs above .... 2.
Mystax largely yellow; the black hairs, if any, mostly below .... 6.
2. Thorax all black haired .... *semitecta* Coq.
Thorax with pale hair above .... 3.
3. Hair in front of the halters and the wings black .... 4.
Hair in front of the halters and the wings yellow .... 5.
4. Front and mid legs with yellow hair; no yellow hair on abdomen, *affinis* Macq.
Front legs black haired; yellow hair on abdomen ..... *macquarti* n. sp.
5. Front and mid legs with much yellow hair; yellow hair on abdomen, *sacrator* Walk.

Little if any yellow hair on legs; frequently no yellow on abdomen, *thoracica* Fabr.

6. Hair in front of the halters wholly black; that in front of the wings also black; abdomen with yellow band near tip .... *sackeni* n. sp.
Hair in front of the halters yellow, at least in upper part .... 7.

7. Hair in front of the wings yellow, or with only a few black hairs.. 8.
Hair in front of the wings largely black .... 12.

8. Abdomen with more or less red hair behind .... *fernaldi* Back.
Abdomen without red hair .... 9.

9. Scutellum, as rest of body, with yellow hair .... *unicolor* Will.
Scutellum black haired .... 10.

10. All tibiæ and tarsi red haired above; about apical half of abdomen yellow .... *partitor* n. sp.
No tibiæ nor tarsi red haired .... 11.

11. The yellow on abdomen near tip; western species .... *californica* n. sp.
The yellow (if any) on abdomen mostly toward base; eastern species, *grossa* Fabr.

12. Posterior part of thorax with red hair .... *insignis* n. sp.
Not red haired on thorax .... 13.

13. Scutellum yellow haired .... 14.
Scutellum black haired .... 15.

14. Abdomen with yellow hair near tip .... *divisor* n. sp.
Abdomen wholly black .... *flavicollis* Say.

15. Very large species; in male front and mid legs with very long yellow hair, and some yellow on hind femora above; wings very dark, *lata* Macq.
Moderate size, wings paler, in male no yellow on hind femora .... 16.

16. Western species .... 17.
Eastern species .... 18.

17. Male with red hair on abdomen; female with hair in front of wings black .... *astur* O. S.
Male without red on abdomen; female with yellow hair interspersed with the black at base of wings .... *colombia* Walk.

18. No yellow hair on the abdomen .... *virginica* n. sp.
Yellow hair on the abdomen .... 19.

19. Superior male appendages deeply excavate on the outer edge; yellow hair in female extends more to base of abdomen.. *champlaini* Walt.
Superior male appendages but little excavate on outer edge; in female yellow hair does not usually extend so far toward base, *posticatus* Say.

Dasyllis virginica n. sp.—In general appearance similar to *D. flavicollis,* but the scutellum is without yellow hair; the basal abdominal segment is black haired on the sides, as are the other segments (in *flavicollis* there is some yellow hair on sides of the basal segment); the body of the male is broader than usual in *flavicollis,* and the superior appendages are more blunt pointed. Length 18 mm.

From Falls Church, Glencarlyn and Chain Bridge, Va., in June.

Dasyllis partitor n. sp.—Head mostly yellow hair; thorax with yellow hair, shorter and more sparse in front; the scutellum black; yellow hair in front of the halters and in front of the wings; the apical half of the abdomen yellow haired, leaving only the small apical segment black; legs with some yellow or tawny hair on the basal parts, but the apex of the tibiæ and the tarsi with red hair above. Length 18 to 20 mm.

From Princeton, British Columbia, July (Russell).

Dasyllis sackeni n. sp.—Black; the hair in front of the halters and in front of the wings is wholly black; head yellow haired except black on vertex behind; legs wholly black haired; thorax yellow haired above, scutellum black haired; abdomen black, but with a band of yellow just before tip, leaving the apical segment black. Superior appendages slightly excavate behind, lower edge deeply rounded. Length 15 to 17 mm.

From Brookdale and Walnut Creek, Calif. (Davidson); and San Francisco and Contra Costa, Calif. (Edwards).

Dasyllis divisor n. sp.—Closely resembles *posticatus,* but the scutellum is yellow haired; the yellow on the abdomen is confined more to the tip; and the abdomen is generally more slender than in *posticatus.* The same size.

From Black Mts., Swannanoa River, N. C., May; and from Illinois and Pennsylvania.

Dasyllis insignis n. sp.—Black; clothed with black and much yellow hair, head with yellow hair, some black on the lower face; thorax with yellow hair above, but a band of red hair on the posterior part and on the scutellum; hair in front of halters yellow; that in front of wing base mostly black; abdomen (except basal two segments) with yellow hair; legs, with front and mid coxæ, and all of femora and tibiæ bearing some yellow hairs, but not dense anywhere. Superior male appendages broadly rounded below, outer side oblique, not excavated. Length 14 mm.

From Labrador; the mss. name of Loew, who had given names to several of the species here described as new, as well as to *champlaini* and to *cinerea.*

Dasyllis californica n. sp.—Black; head yellow haired, except black on the lower part of face and a few black bristles on the vertex; thorax above yellow haired, scutellum with black hair, hair in front of halters and in front of wing base yellow; abdomen with two or three segments near the tip yellow haired; legs with some yellow hair on coxæ, femora and tibiæ of front pair, and on the middle tibiæ. In the male the abdomen is very slender, and the superior appendages plainly but evenly excavate on the outer edge. Length 18 mm.

From Lake Tahoe, Calif. (Vachall); and a part of the type material of *D. astur* from Webber Lake, Yosemite, and Sierra Nevada, Calif. (H. Edwards).

Dasyllis macquarti n. sp.—May be the species recorded by Macquart as the female of *Mallophora analis.* I have a male which agrees with his description. The head is black haired; the thorax yellow above; hair on scutellum, in front of the wings and in front of the halters is black; the legs black haired, except the middle tibiæ are yellow haired on outer side; the abdomen has four basal segments yellow, rest black. The superior male appendages are similar to those of *D. lata* but more swollen below and the outer side only slightly excavate. Length 17 mm.

From Texas.

KEY TO THE NEARCTIC SPECIES OF LEPTOYPHA AND LEPTOSTYLA (HETEROPTERA TINGIDÆ).

By W. L. McAtee.

The genera *Leptoypha* and *Leptostyla,* both of Stål, belong to that section of the Tingidæ in which the rostral sulcus is closed in front and the discoidal and costal areas of the hemelytra, are rarely or never, coëlevated, and to the smaller subdivision in which the rostral sulcus is not interrupted by a ridge between the meso- and metasterni. *Leptoypha* contains species in which the translucent lacy type of structure so characteristic of the family is greatly obscured except on membrane and on costa in the species that have it expanded; there is no pronotal hood. The first two joints of antenna are short and of about equal length, and the pronotum has a single prominent median ridge, the lateral ridges are traceable especially near apex of pronotal extension. The species are very plainly colored, usually being light-brown, more or less dark mottled or pruinose, and with dark callosities. *Leptostyla* species on the other hand are distinctly lacy; a hood is present, the first antennal joint is three times (or more) as long as the second, and there are three high and thin pronotal carinæ. Some of the species of this genus have a distinct color pattern.

Key to the Species of Leptoypha.*

A. Costal margin explanate, reflexed, distinct for its whole length.
  B. Areoles of costal margin in a single series ....*minor* n. sp.

---

* Stål, C., Enumeratio Hemipterorum, 3, 1873, p. 121. The name is frequently misspelled *Leptophya.*

BB. Areoles in more than one series at some part of the costal margin.
C. Two series of areoles extending about as far as apex of pronotal extension .... *costata* Parshley.
CC. Two series of areoles in all but the posterior fourth or less of the costal margin .... *elliptica* n. sp.
AA. Costal margin not explanate, deflexed; subcostal area forming outer anterior margin of hemelytron.
D. Length over 2½ mm.; third joint of antenna nearly four times as long as basal joint, total length of antenna nearly 1 mm., *mutica* Say.
DD. Length less than 2½ mm.; third joint of antenna distinctly less than four times as long as basal joint; total length of antenna .75 mm. or less .... *brevicornis* Champion.

Leptoypha minor n. sp.—Length* (excluding antennæ) 1.81–1.82 mm.; length of pronotum, 1.05–1.08 mm., width, .72–.79 mm.; greatest width of elytra, .84 mm.; length of antennal joints: 1, .099 mm.; 2, .13 mm.; 3, .39 mm.; 4, .23 mm.

Form elliptical; antennæ rather short and thick, upper surface coarsely punctured; punctures not arranged in definite rows except on uniseriate costal margin. Three short blunt spines on front and two straight ones from back of vertex along inner eye margins close to surface of head. Median carina of pronotum distinct; lateral carinæ obsolete.

General color light reddish brown, more or less infuscated as follows: Apical joints of antennæ; head black, vertex, inner orbits, and two closely applied spines with short silvery hairs; region of pronotal callosities; faintly on disc of pronotum and an indistinct U-shaped mark (base forward) on posterior half of pronotum; an irregular band of irrorations across elytra through the posterior half of discoidal areas and another across membrane before apex. Spines on head, edge of rostral sulcus, collar and membrane distinctly lighter than ground color. Ventral surface deeply infuscated on pleuræ, mesosternum and most of venter. Legs light reddish brown; tarsi dark.

Similar to *L. costata* Parshley but much smaller. These two species have more extensive dark markings than is usual in the other species here treated.

L. minor is easily distinguished by its size, and by the possession of distinct and reflexed though narrow costal margins, in all parts of which there is but a single series of areoles.

Type.—A male from Siskiyou Co., California, collected in

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* Measurements taken with eyepiece micrometer with combination of eye-pieces No. 1 and objectives A2 in Zeiss Binocular Microscope; magnification 20.

August; allotype female with same data. Both in collection of U. S. National Museum. I am adopting Mr. Heidemann's cabinet name for this species.

Leptoypha costata Parshley.—*Leptoypha costata* Parshley, H. M. Psyche, 24, No. 1, February, 1917, pp. 16–17 (Marshall Hall, Md.); *Leptoypha distinguenda* Heidemann, Otto. Proceedings of the Entomological Society of Washington, 18, No. 4, Dec. 1916 (June 1917), Pl. 17, Fig. 1, p. 218 (Washington, D. C., Rock Creek, D. C., Marshall Hall, Md., Mt. Vernon, Va.).

Length of a well-developed male specimen (excluding antennæ), 2.83 mm.; length of pronotum, 1.38 mm.; width, 1.05 mm.; greatest width of elytra, 1.1 mm.; length of antennal joints: 1, .13 mm.; 2, .16 mm.; 3, .57 mm.; 4, .23 mm.

Form oblong elliptic, hemelytra expanded across discoidal areas and rather narrowed toward apex. Body surface coarsely punctured, the areoles not in definite rows except in costa and margin of membrane. Percurrent median and shorter lateral carinæ on pronotum distinct. Three short converging tubercles on front and two rather long curved spines from back of vertex reaching past middle of eyes.

General color reddish brown, eyes black, cephalic spines pale. Region of pronotal callosities, indistinct clouding on remainder of pronotum and irrorations across discoidal, and central membranal areas of the elytra fuscous. Lower surface darker than upper; infuscated on pleuræ, pectus, and sides of abdomen. In pale specimens the collar, lateral margins of pronotum, apex of pronotal extension, and costa are distinctly lighter than the ground color.

This species has a distinct, reflexed costal margin of moderate width in which there are two series of areoles from humerus nearly to point where greatest width of elytron is attained, and a single series for the remainder of the length. The lateral carinæ of pronotum are more conspicuous than usual, being readily traceable from point just back of callosities to posterior margin of pronotum.

The only specimens thus far seen are those cited in connection with Mr. Heidemann's description.

Leptoypha elliptica n. sp.—Length of an average male specimen (excluding antennæ), 2.93 mm.; length of pronotum, 1.32 mm.; width, .92 mm.; greatest width of elytra, 1.22 mm.; length of antennal joints: 1, .13 mm.; 2, .099 mm.; 3, .89 mm.; 4, .33 mm.

Form broadly elliptical; hemelytra unusually expanded at middle, broadly rounded at apex. Body coarsely punctured; the areoles in regular rows only on costa and margin of hemelytra; median pronotal carina distinct; lateral ones barely traceable on pronotal extension. Three short but sharp, and convergent, almost fused spines on front of vertex, and two short, sharp, not wholly decumbent, ones from back of vertex along inner margins of eyes.

General color stramineous to light reddish brown; eyes and callosities black; basal and apical joints or whole antennæ infuscated; veinlets across discoidal region of hemelytra (especially on costa) and on membrane more or less embrowned. Head spines, margins of rostral sulcus, and collar paler than ground color. Spots on pleuræ below callosities and mesosternum darker than remainder of lower surface.

This, the largest of the species here considered, has a very wide costal area in which there are two full series of large areoles from humerus to or nearly to the point where elytron begins to curve to form the apex.

Several specimens, labelled simply Texas, in the National collection, of which a male is selected as type. Mr. Heidemann's cabinet name is *discreta*.

Leptoypha mutica Say.—*T*(*ingis*) *mutica* Say, Thomas. Descriptions of new species of Heteropterous Hemiptera of North America, New Harmony, Indiana, December, 1831, p. 26; The complete writings of Thomas Say on the entomology of North America, Vol. 1, 1859, p. 349 (Indiana).

Length of an average specimen (excluding antennæ), 2.9 mm.; length of pronotum, 1.35 mm.; width, .98 mm.; greatest width of elytra, .99 mm.; length of antennal joints: 1, .13 mm.; 2, .099 mm.; 3, .49 mm.; 4, .23 mm.

Form oblong, a little constricted across bases of elytra and somewhat narrowed behind. Surface coarsely punctured; areoles in subcostal area tending to be arranged in three series; a single series of large areoles on membranal margin, merging into the uniseriate costa which can be seen from above only to a point just short of widest part of hemelytra. Median pronotal carina distinct, lateral ones traceable, if at all, only on posterior extension. Spines on front of vertex convergent, appearing almost fused, short, sometimes nearly obsolete, spines from back of vertex decumbent along inner orbits, of variable length, sometimes reaching front of eyes.

General color usually reddish brown, pruinose at various points, especially on head and anterior part of thorax. Eyes dark, callosities black; veinlets infuscated about discoidal areas and on membrane. Cephalic spines, collar and disc of membrane paler. Some specimens are very pruinose, even the antennæ being covered, while others become very dark, sometimes almost black. The areas which most persistently remain light are collar, apex of pronotal extension, and areas at humeral and cuneal portions of elytra. Lower surface usually of uniform ground color except for pale rim of rostral sulcus, and scattered pruinosity.

In *L. mutica* and *L. brevicornis* the costal area, according to the point of view, is obsolete or deflexed anteriorly. The species are therefore more slender and more nearly parallel-sided in appearance than others of the genus. Viewed from above the subcostal area forms the lateral margin of the hemelytra from humerus to a point just back of widest part. From the side or beneath, however, the deflexed costa can be seen and inspection of its surface reveals a uniseriate arrangement of the areoles. *L. mutica* has the third antennal joint nearly or quite four times as long as the basal joint.

This species, which varies greatly in color, being sometimes almost entirely black is very common in the vicinity of Washington, D. C., on fringe-tree (*Chionanthus virginica* L.) and on various species of ash (*Fraxinus*). It has been collected on the food plants from May to October, has been found hibernating among old leaves, and the nymphs have been seen from July to September.

Other specimens seen show that the species occurs also in Nebraska, Wisconsin, Ohio, Ontario, New Jersey, Tennessee, and Texas.

Leptoypha brevicornis Champion.—*Leptoypha brevicornis* Champion, G. C. Biologia Centrali-Americana. Insecta. Rhynchota. Hemiptera-Heteroptera, Vol. 2, p. 32, December, 1897 (Omilteme in Guerrero, Mexico, 8,000 feet).

Length (excluding antenna), 2.27 mm.; length of pronotum, 1.13 mm.; width, .82 mm.; greatest width of elytra, .89 mm.; length of antennal joints: 1, .099 mm.; 2, .099 mm.; 3, .36 mm.; 4, .19 mm.

Form not so narrowly oblong as in *L. mutica*, the pronotum proportionally broader. Coarsely punctured, subcostal area largely triseriate; inner margin of membrane with a single series of large areoles which becomes two at apex and merges into the single series of costa which can be seen (from above) to a point just behind greatest elytral expansion. Cephalic spines as in *L. mutica.*

Color stramineous to light reddish brown; eyes and callosities black; veinlets infuscated across discoidal areas and on membrane; pruinosity generally distributed. Under surface reddish brown, bucculæ paler, pleural spots and mesosternum darker; more or less pruinose.

L. brevicornis is smaller than *L. mutica;* the antenna is shorter and the third joint of antenna is distinctly less than four times as long as the first; a proportion which it nearly or quite attains in *L. mutica*. However, the two forms are very closely related and it may well prove that *brevicornis* is a southern and western subspecies of *mutica*.

From their perfect agreement with description and figure (Pl. 2, fig. 28) of *L. brevicornis,* two specimens collected in the Argus Mountains, California, April, 1891, by Albert Koebele are assigned to this species. Specimens collected by Mr. C. A. Hart at Brownsville, Texas, December 8, 1910, and November 21, 1911, also are referred here.

Key to the Species of Leptostyla.*

A. Pronotum widest at about middle; paranota angulate....*velifer* n. sp.

AA. Pronotum widest behind; paranota not angulate.

- *B.* Third joint of antenna shorter than pronotum; anterior third of costal margin with two series of about equal-sized areoles; elytra widest near base....................*clitoriæ* Heidemann.
- *BB.* Third joint of antenna about as long as pronotum; anterior third of costal margin not with two series of equal-sized areoles; elytra widest near apex.
  - *C.* Form narrower; elytra widest near apex; anterior third of costal margin with a single series of large rectangular areoles; costal cross-veinlets hyaline.......................*oblonga* Say.
  - *CC.* Form broader; elytra about as wide across discoidal areas as at apex; anterior third of costal margin with an outer series of large areoles and an interdigitating inner series of small areoles; costal cross-veinlets dark, *heidemanni* Osborn & Drake.

Leptostyla velifer n. sp.—Length of an average specimen (excluding antennæ and cephalic spines), 2.93 mm.; length of pronotum, 1.28 mm.; width, 1.22 mm.; greatest width of elytra, 1.32 mm.; length of antennal joints: 1, .36 mm.; 2, .099 mm.; 3, 1.36 mm.; 4, .33 mm.

Antennæ long and slender; three long, diverging, sharp-pointed spines on head, underneath the median one of which are two shorter laterally converging spines. Paranota flaring, roundly angulate at middle, strongly reflexed, so that rounded posterior angle is almost vertical to surface of pronotum; four rows of areoles at widest point. Hood oblong, wider and higher behind; carinæ thin, high and distinct, the lateral ones, uniseriate and simply arched, the median one with a single series of large squarish areoles, the upper edge, higher in front, rounded at the ends and sinuate in middle. Costal area with large areoles in from two to three series; subcostal with the same number of series of smaller areoles; discoidal area with conspicuously raised margin.

Color stramineous; basal and terminal joints of antennæ, eyes, nonmembranous parts of thorax, spots near apices of outer margins of discoidal areas, and under surface, except edges of rostral sulcus and legs, fuscous to black. Legs, intermediate antennal joints, edges of carinæ, etc., a few cross veinlets in costa and some in membrane testaceous.

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* Stål, Enum. Hemip., 3, 1873, p. 120.

The angulate expansions of the pronotum and the comparatively large size of this species give it the aspect of a *Gargaphia.* However, it has the generic characters of *Leptostyla.* In this genus it needs to be compared particularly with *L. elata* Champion (Biol. Centr.-Amer. Heteroptera, 2, p. 16, 1897). It differs from that species in the greater development of the hood, the front declivity of which also is much steeper; in having 3 as the maximum and 2 as the minimum number of series of areoles in the costal margin, instead of 4 and 3 respectively, and in having less dark marking.

From *L. dilaticollis* Champion (pp. 18–19), to which it is not so closely related, it differs in having 3 long, diverging, instead of 2 short, converging spines on vertex; in the first antennal joint being more than 2½ times as long as second; and in having the maximum number of series of areoles in the costal margin 3 instead of 4.

First and last joints of antenna, base and spot near apex of discoidal area, a few veins in costal area and apical third of elytra fuscous to black; membranous parts of body hyaline, most of the veins testaceous; legs and intermediate antennal joints of same color.

Numerous specimens obtained in Arizona in 1882 by H. K. Morrison, all in National Collection. A female type and male allotype have been selected. Both Uhler and Heidemann used the cabinet name *velifica* for this species. Uhler also at one time called it *Gargaphia reticulata.*

Leptostyla clitoriæ Heidemann.—*Leptostyla clitoriæ* Heidemann, Otto. Proc. Ent. Soc. Wash., 13, No. 3, July–Sept., 1911 (September 30, 1911), pp. 180–181, fig. 4 (Rock Creek, D. C., Washington, D. C., Plummers Island, Md., Columbus, Texas); *Leptostyla costofasciata* Drake, Carl J., Ohio Jour. of Sci., 16, No. 7, May, 1916, pp. 326–328 (Clarksville, Tenn.).

Length of an average specimen (excluding antennæ), 2.24 mm.; length of pronotum, .957 mm.; width, .72 mm.; greatest width of elytra, .957 mm.; length of antennal joints: 1, .099 mm.; 2, .099 mm.; 3, .757 mm.; 4, .18 mm.

Form broadly oblong, constricted at humeri and again beyond discoidal areas; hemelytra widening again behind. Superior median spine of head long, ascending, then somewhat decurved, inferior median spines shorter, in and up curved so that they and the superior spine to a certain extent converge; lateral spines short, projecting straight forward along inner orbits. Pronotum (disregarding posterior extension) heart-shaped, the apex cut off by a line farthest advanced at anterior angles and middle, sinuate between. Hood not conspicuous, paranota well reflexed, biseriate; carinæ moderately high, uniseriate, the lateral ones arched, the median bisinuate. Costal area mostly biseriate; subcostal and discoidal areas mostly triseriate.

Among the species included in the above key, *L. clitoriæ* is easily recognized by its small size, shortness of antennæ, and very dark color. The underside of body and all median parts of upper surface, except hood, apex of pronotum and three large areoles in sutural area vary from fuscous to black (the discs of areoles may be hyaline or whitish) and lateral extensions of this pattern are found on posterior part of pronotal margin, on costal area at widest part of elytra and near apex of elytra. The lateral margin otherwise is clear; the veinlets stramineous. The first, second, and fourth antennal joints vary from fuscous to black, the third joint and the legs from stramineous to testaceous.

The species is abundant about Washington, D. C., and occurs not only upon the plant (*Clitoria mariana* L.) for which Mr. Heidemann named it, but also on various species of *Lespedeza* and *Meibomia*. Specimens have been collected from late June to September. Examples of the species from Tennessee and South Carolina also have been seen. Mr. Heidemann compares the species to *L. constricta* Champion, to which indeed it is very similar. If the respective illustrations can be trusted, however, the species are sufficiently distinct. The pronotum of *L. constricta* is longer and narrower than the same part in *clitoriæ* and the hemelytra are much more constricted beyond the discoidal area and do not widen again as they do in the present species. *L. constricta* is recorded from the Nearctic region by Van Duzee, but no specimens have been seen by the writer.

Leptostyla oblonga Say.—*Tingis oblonga* Say, Thomas. Descriptions of new Hemipterous Insects collected in the expedition to the Rocky Mountains . . . under command of Major Long. Journal of the Academy of Natural Sciences of Philadelphia, Vol. 4, 1825, pp. 326–327; Compl. Writings, Vol. 2, 1859, p. 248 (Missouri).

Length of an average specimen (excluding antennæ and spines), 2.83 mm.; length of pronotum, 1.08 mm.; width, .79 mm.; greatest width of elytra across discoidal areas, .92 mm.; near apex, .99 mm.; length of antennal joints: 1, .26 mm.; 2, .08 mm.; 3, 1.32 mm.; 4, .39 mm.

Form narrowly oblong constructed at humeri and just before tip of elytra. Head with three long, sharp spines from back of vertex, under the median one of which are two shorter laterally converging ones arising from front of vertex. Hood well developed, oblong, broadest and highest in front. Paranota well reflexed, with a single series of large squarish areoles. Carinæ moderately high, uniseriate; the lateral ones viewed from above, a little wavy behind. Costal area with a single series of large squarish areoles from humeri to or near end of discoidal area, biseriate near constriction, then again uniseriate.

Underside of body (except edges of rostral sulcus), eyes, nonmembranous parts of pronotum and spots near apices of discoidal areas black. Basal and apical joints of antennæ fuscous to black; intermediate joints and legs stramineous to testaceous, tips of tarsi black; membranous parts of upper surface mostly whitish hyaline; crest of hood, veins on sutural area, and membrane brown; the subcostal and discoidal areas sometimes have a brownish ground color.

This is the only American *Leptostyla* known that has a single series of large, rectangular areoles in the costal area, of which they occupy the anterior third. This character together with the entirely hyaline lateral margins of the elytra, clearly distinguish the species.

Specimens examined are from West Point, Nebr.; Ames, Iowa; Cahokia, Ill.; Polk County, Wis.; Amery, Wis.; Glen Echo, Md.; and Maryland near Plummers Id. The last specimen listed was taken by the writer, July 26, 1914, on a thin-leaved, climbing, leguminous plant (*Falcata comosa* L.). The Ames, Iowa, specimens were collected July 9, 1894, by Dr. E. D. Ball on *Petalostemon*. Dr. Ball tells me that almost every plant of this genus found on dry gravelly knolls bears specimens of this tingid. The Amery, Wis., examples were found on a basswood leaf by Mr. D. M. De Long.

Leptostyla heidemanni Osborn & Drake.—*Leptostyla heidemanni* Osborn, Herbert and Drake, Carl J. The Tingitoidea of Ohio, Ohio State University Bulletin 20, No. 35, June, 1916, pp. 238–239 (Arkansas, Washington, D. C., Newton, Mass.).

Length of an average specimen (excluding antennæ and spines), 3.1 mm.; length of pronotum, 1.18 mm.; width, .86 mm.; width of elytra across discoidal areas, 1.02 mm.; near apex, 1.05 mm.; length of antennal joints: 1, .26 mm.; 2, .08 mm.; 3, 1.25 mm.; 4, .36 mm.

Very similar to *L. oblonga*. The hood is more rounded triangular in outline viewed from above, but as in *oblonga* is highest and widest in front. *L. heidemanni* is further distinguished structurally from *oblonga* by the elytra being practically as wide across discoidal areas as near apex; and by the possession of two series of areoles in anterior part of costal area, of which the inner are smaller and alternated with the larger ones of the outer series.

In color this species is similar to *oblonga*, with the chief exception that the cross-veinlets of the costal area are dark. A few cells at apex of elytra and just within the posterior convexity of the elytron also are infuscated.

Of the numerous species of *Leptostyla* mentioned in the Biologia Centrali-Americana, *L. heidemanni* need be contrasted only with *gracilenta* and *angustata.* Both of these species have the subcostal area biseriate, while *heidemanni* has from three to four series of areoles in this division of the hemelytron; furthermore, those species have two series of full-sized areoles in the costal area instead of one series of large and one of small cells.

Leptostyla heidemanni is extremely common about Washington, D. C., on its food plant *Baptisia tinctoria* L., which is not only often, but usually, severely injured by the feeding operations of these little Tingids. Other localities represented by the material examined are: Forest Hills and Springfield, Mass., New Jersey, and Shreveport, La. Mr. Heidemann's cabinet name for this species was *L. affinis;* I have also seen the name *similis* on some specimens.

STUDIES IN THE OLD TESTAMENT.

By R. P. Dow, Brooklyn, N. Y.

Before considering each insect in the order of its mention in the Old Testament, it might give a better understanding if the order of creation as given in Genesis is compared with the order assumed by modern science to be the correct one. Our evolutionary theories are less than a century old. The writers of the Pentateuch may have been ignorant of the nature of the world as a component of the universe, and may have been filled with the wisdom of ages since forgotten. But that does not figure in the Book, the allegory, and the imagery of which is always graphic. The progress of creation is given day by day, the verbal order not agreeing with the correct sequence of time. Genesis I: 11 narrates that on the third day came grass, the herb yielding seed, the fruit tree reproducing itself. On a day following the moon and the stars were placed in the heavens. Well, what of it? None of the greatest philosophers of Greece or Rome had progressed sufficiently to have an improved order in his mind. During the present century the head of the great Arab University in Cairo was asked whether the earth revolved around the sun or the sun around the earth. After long reflection he replied that he had never given the matter any thought, for it seemed to be of no importance and certainly of no consequence to him. It was of no consequence to the writer of Genesis I, but does his narrative suffer?

As a next step the waters brought forth living creatures, first fowls, then whales, and every living creature in the waters. Then followed all the creatures of the land, cattle, creeping thing, beast of the earth, and finally man. There is no profit in comparing this sequence with present notions; merely regrettable that commentators of fifteen centuries have wasted efforts to distort facts to fit literal construction of allegory given with the utmost poetic license.

Genesis II:2 relates that Adam in a day reviewed every living creature in Eden and gave to each its name. Ninety years ago the Linnean Society of London was engaged in an effort to identify a few species of the genus *Apion*, of which Herbst's descriptions were not clear, and of which actual specimens could not satisfactorily be laid out so as to differentiate into species. Rev. William Kirby was at this time leading spirit in the Linnean Society and a vigorous polemical preacher. He argued from the pulpit that the circumstance proved the immensity of the fall of man from Eden, since Adam had mentality to name every insect in a day, while the Linneans struggled for months over a few beetles. The number of insect species in existence, estimated by Ray in 1698 at 20,000, was surely estimated in Kirby's day as multiplied by a hundred at least. Here again the pitiful results of distorting fact to fit allegory. Every creature received a name from the first man who tried to tell another about it. Every minute insect must have a name if it is to be made a subject of comment.

Genesis VIII describes the Flood, which was certainly a vast one, as it is described in the literature of almost all eastern countries. The Biblical account is very explicit indeed, how Noah, ninth generation from Adam, constructed an ark, saved his family and all kinds of living creatures, some in pairs, others in sevens. The waters prevailed upon the earth 150 days. The ark measured exactly 300 by 50 by 30 cubits. In the first place a pair of every known animal would not fit within the space. Again, the insect population could not be sustained alive that length of time without ample supply of every food plant. Moreover, all gill-breathing creatures could survive outside in their antediluvian abundance, and the conventionally fixed 5,000 years or less since the flood would not suffice to restore the balance of numbers between creatures with lungs and creatures with gills. The best that the literal interpreters can do with this passage is to argue that evolution has multiplied the number of species and that the ark *did* contain every species then existing. At the present rate of evolving new species it would take to double the number of animals at least a hundred times the number of years that have elapsed since the flood. It is merely more pity that Genesis should be distorted.

In Leviticus appears a list of insects that may be eaten, the definition being "flying creeping thing that goeth upon all four, which have legs above their feet, to leap withal upon the earth." The inspired lawgiver of Leviticus was not an entomologist. He had not observed, perhaps no one had observed that an insect has six legs. Even Aristotle described the day fly as having four legs. How thoroughly absurd are some comments by sermon writers trying to twist out of their own difficulties. One clergyman wrote that the locust has only four crawling legs and that Moses could not consider the saltatory ones as legs at all. An English preacher declared that the forefeet of insects are so often *used as paws* that they cannot be properly considered as feet.

The first Old Testament mention of a creature undoubtedly an insect is in Exodus VII., describing one of the plagues. The plague of hail has often been interpreted as an insect plague, their being nothing about the Hebrew word to indicate that it means hail rather than any other damaging instrument. Evidence is too slight for argument, so better accept the hail. The plague to be examined is thus described in the King James English: "Stretch out thy rod, and smite the dust of the land, that it may become lice throughout all the land of Egypt. And they did so; for Aaron stretched out his hand and his rod, and smote the dust of the earth, and it became lice in man and in beast; all the dust of the land became lice throughout all the land of Egypt. And the magicians did so with their enchantments to bring forth lice, but they could not; so there were lice upon man, and upon beast."

The Hebrew word is *kinnim* (always plural), and it occurs again in Psalm CV as a direct paraphrase throwing no light upon its meaning. There have been great differences of opinion about its proper translation. Commentators have dug up a Hebrew verb root implying to be fixed or remaining fast, this to back up a translation as ticks with lice as a second choice, but the root is in doubt. In the Talmuds there appear not a few references to *kinnah,* meaning there lice without possibility of mistake. This was the word which caused the King James translators to agree upon lice. Even before the time of the Septuagint there had been noted a resemblance to the Greek word *knips,* plu. *knipes;* but to connect the two the consonant *ps* must be gotten rid of in violation of every etymological law. In the Syriac version the word was first spelled *Ciniphes,* this translator taking it for granted that the word was the same *knipes.* The Roman fathers based their ideas on this version. St. Augustine says: "*Scyniphes musculæ sunt brevissimæ,*" and Arnobius Afer, 295 A. D., expresses the same idea. That the *kinnim* were flies was wholly a Roman interpretation. This plague was known to Flavius Josephus, the Roman historian, who regarded the beasts as lice, getting his information not from the Old Testament, which he never saw, but from the Chaldæan Targum, or Commentary. The Polyglot translators held to Josephus and used the word *pediculi,* which is both good Latin and modern scientific for the various species of lice. In the English Revised version there is a marginal note suggesting fleas or sand fleas, this idea being accepted from the argument of an eminent Mediæval Rabbi. The translations as ticks are for the most part quite modern. The scholars of Linnæus were inclined to fix upon the *Acarus sanguisugus,* the blood-sucking mite.

Even more than in any previous passage of the Pentateuch there occurs in the present instance the repetition of phrases which is the poetic form which is the equivalent of rhyme or rhythm in other languages. The writer of Exodus knew perfectly well what *kinnim* were, for lice were a constant plague in Egypt, but he cared little what beast it was that figured as the maker of the great plague. His expression is merely unliteral allegory of obstacles piled up to prevent the exodus of the Hebrews, and to identify a species in connection with it is at best arrant nonsense.

In the same chapter of Exodus, verses 21, 22, 24, and 29, is described another plague, in the King James version thus:

"I will send swarms of flies upon thee, and upon thy servants, and upon thy people, and into thy houses; and the houses of the Egyptians shall be full of swarms of flies, and also the ground whereon they are.

"And I will sever the land of Goshen, in which my people dwell, that no swarms of flies shall be there.

"And there came a grievious swarm of flies into the house of Pharaoh and into his servants' houses, and into all the land of Egypt; and the land was corrupted ('destroyed,' margin) by reason of the swarm of flies.

This plague was not unlike its predecessor, described in general terms, not giving or intending to give any clear idea of its nature. The word used is *arob*, about the etymology or meaning of which there is no doubt. It means swarm, multitude, abundance. In the King James translation the word *zebub* is understood, making it mean swarm of flies. The trouble with this interpretation is that swarms of flies are a constant plague in Egypt, causing more ophthalmia than in any other land in the world. *Musca domestica* is more plentiful than all other insects combined. It is hard to imagine how in any number they could constitute a great plague to figure in the greatest narrative ever written. The commentators in all centuries have very generally taken some such view and made every effort to demonstrate that the swarm was something much more terrible than ordinary flies. The Roman fathers generally construed it as a mixture of various kinds of flies. Some of the Jews before the Christian era interpreted it as various animals. Flavius Josephus got his information about the matter from the Babylonian Targum. A seventeenth century translation of Josephus renders it "a mixture of noisesome beasts," which phrase appears in the margin of the King James version. An Arabic version comes out more strongly, "a mixture of wild beasts, venemous insects and reptiles." An eminent Rabbi of the Middle Ages wrote: "all kinds of venemous animals, as serpents and scorpions." Still another Rabbi laid stress upon the presence of winged scorpions, a peculiar animal in some ways like the unicorn, figuring much in literature of all ages, but of which a specimen has never been found. Even Pliny speaks of the winged scorpion as absolutely deadly. Eben Ezra wrote: "all the wild beasts mingled in association, as lions, bears and leopards." A Portuguese Rabbi said: "a mixture of vermin." Dr. Geddes: "a swarm of beetles," but he at once proved his own ignorance by describing the beetle, the *Blatta ægyptiaca,* a voracious cockroach. Dr. T. M. Harris reviewed the situation judicially and decided that one particular species was meant, not a mixture of different animals. The septuagint settled upon the *kunomuia.* Michaelis insisted on *Tabanus.* Dr. J. D. Westwood, of Oxford, regarded it as *Culex* and argued his case. A Smithsonian expert has chosen *Hippobosca equina,* and claimed for the *zebub* of Ecclesiastes and Isaiah either *Hæmatopota pluvialis* or *Chrysops cæcutiens.* The common Arabic word for fly, *zimb,* is not often quoted in evidence. Much, however, has been written in claim of *arob* of *zebub* as the creature implied in the word of an Ethiopian translation, which by the way still survives to describe a terrible gadfly, tsaltsalya. This has been claimed to be the African fly alluded to in Isaiah, and has even been identified as the tsetze fly, its author asserting that this horse-killing parasite was known to the writer of Exodus.

At all this farrago the author of Exodus might well be astonished. He was a poet, not a natural historian, wherefore his allegory is all the more beautiful.

A KEY TO THE SPECIES OF DICTYOPHARA GERM.

By Edmund H. Gibson, U. S. Bureau of Entomology.

The genus *Dictyophara* Germ. is represented in the United States by four species, all of which are common east of the Rocky Mountains and especially so in the south. However, they are seldom observed or captured in large numbers, and although plant feeders their exact economic status is not known.

Dictyophara belongs in the tribe Dictyopharini of the subfamily Dictyopharinæ and may be distinguished from the only other two genera, *Scolops* Schaum. and *Phylloscelis* Germ. of the same tribe which occur north of Mexico, by its triangularly produced vertex.

This paper is based upon a large series of specimens in the collection of the U. S. National Museum.

Dictyophara Germ. *Dictyophara* Germar in Silb. Rev. Ent., I, p. 175, 1833; *Pseudophana* Burmeister, Handb., II, 1, p. 146, 1843; *Chanithus* Kolenati Mel. Ent., VII, p. 29, 1857; *Nersia* Stål, Bidr. Rio Jan. Hem., II, p. 62; 1858.

Dictyophara may be characterized as follows: Vertex produced triangularly with three carinæ, the median one in certain species ending before the middle; three frontal carinæ more or less parallel: pronotum short and emarginate on posterior border: forewings long, greatly exceeding the abdomen and more or less reticulate. Species usually bright green with but slight color markings or variations. The logotype of the genus is *europœa* Linn.

Key to the Species.

1. Transverse veinlets of the forewings forming three nearly regular bands .... *dioxys* Walk.
   Transverse veinlets of the forewings in no regular pattern .... 2.
2. Length of vertex twice or more its basal width ...... *microrhina* Walk.
   Length of vertex slightly longer than its basal width .... 3.
3. Frontal carinæ meeting in an obtuse angle and tinged with black. Female plates short, extremely broad and rounding ...... *florens* Stål.
   Frontal carinæ meeting in an acute angle and not tinged with black. Female plates long and narrow .... *lingula* VanD.

Dictyophara dioxys Walk. *Dictyophara dioxys* Walker, List of Hom., Suppl., p. 61, 1858; *Nersia curviceps* Stål, Bidr. Rio Jan. Hem., p. 64, 1861.

This species may easily be separated from the other three species by the cross veinlets of the forewings forming three more or less regular bands. The vertex is hardly twice as long as wide and in this respect would come between *microrhina* and *lingula*. It is known to occur from New Jersey south and west through Texas.

Dictyophara microrhina Walk. *Dictyophara microrhina* Walker, List. Hom., Vol. 1, p. 315, 1851.

This is the largest of the North American species with a vertex more than twice as long as wide. The apical half of the forewing is very finely reticulated. The elevation of the apex of the vertex varies considerably within the species. This is the most common of our species and has a distribution from New York west to Kansas, south to Texas and Florida.

Dictyophara florens Stål. *Nersia florens* Stål, Bidr. Rio Jan. Hem., II, p. 64, 1861.

The most prominent specific characters of this species are its short vertex which is but little longer than its basal width, its wide front with carinæ meeting in an obtuse angle, and the carinæ being tinged with black just before and at their point of meeting. Specimens are at hand from Kansas, Texas, and Florida.

Dictyophara lingula Van D. *Dictyophara lingula* VanDuzee, Proc. Acad. Sci. Philadelphia, Dec., 1907.

Very similar to *florens* but without black markings near the apex of vertex or base of front. The frontal carinæ do not diverge before meeting as much as in *florens*. They meet in an acute angle. Length of the vertex is slightly more than its basal width. It is known to occur from New Jersey to Florida.

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Vol. XII OCTOBER, 1917 No. 4

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THE FAMILY ISOMETOPIDÆ FIEB. AS REPRESENTED IN NORTH AMERICA. (HETEROPTERA.)

By Edmund H. Gibson, U. S. Bureau of Entomology,
Washington, D. C.

A keen interest was taken in the family Isometopidæ by the late Mr. Otto Heidemann which resulted in a short but very admirable treatise which he published in 1907. Since that date there has been no further contribution to our knowledge of this little but interesting and rather unique group.

With the addition of one new genus and three new species herein described the family is represented in North America by three genera and seven species. Members of the family are also known to occur in Central Europe and in the East Indies. These little insects are not at all common and are considered prizes to the collector. Their seeming rarity may be due to their minute size and to the habit, of at least a few species, of feeding on the bark of trees.

The family was first described by Fieber in 1860 and at times has been considered a subfamily of Miridæ but to the writer and several others this seems unwarranted.

The family Isometopidæ may be characterized as follows: head short, vertical, and more or less depressed beneath resembling the head of a Homopteron; antennæ four jointed with the second joint longer than the other three taken together; rostrum four jointed; eyes large; ocelli near the base of the head and considerably raised; thorax much wider than head and prominent; scutellum prominent being considerably raised above the elytra; Membrane with two cells.

KEY TO THE GENERA.

1. Lateral borders of pronotum wide, more or less flaring, and with carinae ....2.
   Lateral borders of pronotum distinctly rounded, and without carinae, **Lidopus** n. g.
2. Anterior border of pronotum much narrower than posterior; lateral borders if produced would meet at a point on the front of the head, **Myiomma** Put.
   Anterior border of pronotum slightly narrower than posterior; the lateral margins if produced would meet at a point considerably before the front of the head............................**Isometopus** Fieb.

Genus **Lidopus** n. g.—Form ovate. Head very short, vertical, front depressed beneath. Base of vertex higher than anterior margin of pronotum. Rostrum extending to posterior coxæ. Ocelli distinct but not prominent or raised. Eyes large, distance between them less than width of an eye. Antennæ with second joint longest. Head fitting snug against the pronotum. Pronotum narrowed anteriorly but little, if sides were produced they would meet at a point considerably before front of the head. Lateral margins of pronotum broadly rounded with but a slight trace of a carina. Scutellum with sides equilateral.

Type of the genus is *heidemanni* n. sp.

This genus resembles *Myiomma* in form and general shape of the head but differs from it as well as from *Isometopus* by the extremely convex pronotum with broadly rounded lateral margins.

Lidopus heidemanni n. sp.—Head short, compact, vertical, and more or less depressed beneath. Front nearly flat. Eyes large, distance between them less than the width of an eye. Ocelli small but distinct. Antennæ with the first joint the shortest and the second twice as long as the others taken together, fourth shorter than the third, second joint gradually swollen towards the apex. Rostrum reaching to the first abdominal segment. Pronotum strongly convex above with lateral margins broadly rounded and with but a slight trace of a carina, lateral margins if produced would meet at a point considerably before the front of the head. Pronotum and scutellum evenly punctate. Scutellum with sides equilateral and raised above the elytra. Elytra nearly flat, costal margins somewhat flaring. Membrane extending for nearly half of its length beyond the cuneus. Legs short. Posterior femora swollen. Length of female 2.3 mm. from front of head to apex of elytra. Male 2 mm. Width across posterior margin of pronotum .75 mm.

Color.—Head, pronotum and scutellum dark reddish brown to black. Apex of head lighter brown. Second and fourth antennal joints dark, third yellow to cream. Pronotum and scutellum shiny; apex of scutellum white or cream colored. Elytra dark brown, becoming even darker at apex and along costal border. Two transverse white streaks at the base of the cuneus. Membrane smoky. Under side dark reddish brown, legs dark with light bands at apex of femur and tibia. Middle and hind coxæ white.

Described from seven females and three males collected by Messers E. A. Schwarz and H. S. Barber at San Diego and Brownsville, Texas, and now in the collection of the U. S. National Museum.

Named in honor of the memory of the late Mr. Otto Heidemann.

This species can easily be recognized from all others of the family by its extremely convex pronotum and color pattern of the elytra.

Genus **Myiomma** Put.—*Myiomma* Puton, Hémiptères, Ann. Soc. Ent. France, Vol. 3, ser. 5, pp. 20–21, 1873. *Heidemannia* Uhler, Proc. Ent. Soc. Washington, Vol. 2, No. 1, 1891.

Form elliptical, nearly flat above. Head small, projecting above the pronotum; eyes large; vertex triangular; face oblong, curving backwards beneath. Antennæ attached beneath inner angle of the eyes. Pronotum transverse, anterior border much narrower than posterior; lateral margins flaring. Costal margins of elytra feebly curved, broadly reflexed; membrane blunt. Legs short, anterior femor wide. Type of the genus is *fieberi* Put.

Myiomma cixiiformis Uhl.—*Heidemannia cixiiformis* Uhler, Proc. Ent. Soc. Washington, Vol. 2, No. 1, 1891.

This species can be easily separated from all other Isometopidæ by the extremely small head with eyes nearly meeting. Both Uhler and Heidemann dwelt on the habits and description of this species in detail in their treatises. It is known to occur in New York, Delaware, Maryland, and Virginia.

Myiomma media n. sp.—Head short, broad, vertical, with apex depressed as in *cixiiformis* Uhl. Eyes large and bulging as in *Isometopus.* Distance between eyes slightly less than width of an eye. Ocelli large, prominent and considerably raised. Posterior border of head distinctly concave. Pronotum short and broad, much narrowed anteriorly. Lateral sides of pronotum if produced would meet at a point on the front of the head. Lateral margins flaring but not as much so as in *Isometopus.* Scutellum large, longer than the basal width. Pronotum and scutellum strongly pubescent. Elytra elongate, sides nearly straight. Length 2.5 mm.

Color.—Head, pronotum, and scutellum dark reddish brown. Elytra light fuscous, blotched with darker fuscous. Reddish beneath.

Described from a single male specimen collected by Messers E. A. Schwarz and H. S. Barber at Williams, Ariz., and now in the collection of the U. S. National Museum.

The specimen described is neither a typical *Myiomma, Isometopus,* or *Lidopus,* but as the form of the pronotum is nearest *Myiomma* it appears best to place it in this genus until more specimens are procured.

Genus **Isometopus** Fieb.—*Isometopus* Fieber, Exegesen. Wiener Ent. Monatschrift, iv, pp. 258–259, 1860. *Cephalocoris* Stein, Berl. Ent. Zeit., p. 79, 1860.

Somewhat broadly ovate; head broad, rounded in front. Third and fourth joints of antennæ slender and short. Pronotum transverse, posterior border slightly wider than anterior, lateral borders if produced would meet at a point considerably before front of head, lateral margins flaring. Hemelytra convexly ampliated on each side.

Type of the genus is *intrusus* H. S.

Key to the Species.

1. Elytra uniformly dark in color .... *unicolor* Heid.
   Elytra not uniformly dark in color, with a more or less definite color pattern 2
2. Posterior half of pronotum and scutellum light in color; antennæ, rostrum, and legs dark .... *libertus* n. sp.
   Entire portion of pronotum and scutellum dark brown or black; antennæ, rostrum, and legs light fuscous or white 3
3. Fuscous markings at center and apex of corium .... *signatus* Heid.
   No fuscous markings at center or apex of corium. The only color markings are at apex of clavus and center of posterior margin of corium .... *pulchellus* Heid.

Isometopus unicolor Heid.—*Isometopus unicolor* Heidemann, Proc. Ent. Soc. Washington, Vol. 9, p. 130, 1907.

This species can readily be distinguished from all others by it's uniform color. No distinct color markings. It is also slightly larger than either *signatus* or *pulchellus* and about equal to *libertus.* Its occurrence has been reported from Arizona.

Isometopus libertus n. sp.—Form ovate. Head short, broad, vertical. Eyes large, distance between them greater than width of an eye. Ocelli small but distinct. Eyes protruding to the rear of the posterior line of the vertex. Second joint of antennæ slightly swollen at apex. Basal width more than twice the length of pronotum. Anterior half of pronotum slightly depressed but with a transverse ridge in the center, not running to the lateral borders. Posterior border of pronotum straight, lateral margins flaring and if produced would meet at a point considerably before the front of the head. Scutellum large and raised above the elytra. Surface of the elytra convex. Pronotum, scutellum, and elytra densely clothed with fine hairs. Posterior femora swollen but not greatly so. Length of female 2.2 mm. Width at base of pronotum 1 mm.

Color.—Head and anterior half of pronotum black, but with base of head tinged with light russet. Antennæ dark brown. Posterior half of pronotum, scutellum, and elytra russet brown. Elytra with an irregular transverse darker brown band. Membrane smoky. Beneath dark brown to black.

Described from a single female in the collection of the U. S. National Museum bearing a Schwarz and Barber collector label. The specimen was taken at Las Vegas H. S., New Mexico.

Easily recognized by the light colored scutellum and the pronotum being divided into two color bands or zones.

Isometopus signatus Heid.—*Isometopus signatus* Heidemann, Proc. Ent. Soc. Washington, Vol. 9, pp. 129–130, 1907.

This species may be differentiated from the others of the genus by the color pattern of the elytra which is in the form of an irregular H. Two large fuscous spots on the center of the corium joined at the apex of the clavus and fusing into the fuscous apex of the cuneus. Specimens are at hand from Texas.

Isometopus pulchellus Heid.—*Isometopus pulchellus* Heidemann, Proc. Ent. Soc. Washington, Vol. 9, pp. 128–129, 1907.

Easily recognized by its white or cream colored elytra which is in contrast to the more or less shiny black pronotum and scutellum. Elytra with small fuscous spots at apex of clavus and near center of the posterior margin of the cuneus. Recorded from New York, West Virginia, and Virginia.

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A FEW NOTES CHIEFLY ON THE NAMES OF NEARCTIC TINGIDÆ.

By W. L. McAtee, Washington, D. C.

Acalypta grisea Heidemann. *Acalypta grisea* Heidemann, Otto. Two new species of lace-bugs (Heteroptera; Tingidae). Proceedings of the Entomological Society of Washington, 18, No. 4, December, 1916 (June 11, 1917), pp. 217–9, Pl. 17. According to Mr. J. R. de la Torre Bueno, this is a synonym of his *A. lillianis.* This is a fault for which I must own responsibility. I prepared Mr. Heidemann's article for the press, but had never seen *A. lillianis* and its publication therefore did not register very deeply on my memory.

Corythucha marmorata Uhler. The food plants of this species in the vicinity of Washington, D. C., are various members of the genus *Aster.*

Corythucha cratægi Morrill. *Corythuca arcuata cratægi* subsp. nov. Morrill, August, W. Notes on the Immature Stages of some Tingitids of the Genus *Corythuca,* Psyche 10, pp. 132–133, August, 1903.

In their paper "The Tingitoidea of Ohio,"* Osborn, H. and Drake, Carl J., describe the adult of this form, noting that they find it a distinct species. They call it *Corythucha cratægi* sp. nov., but it is clear that Morrill must be the authority for this name since he describes the egg of *cratægi* and calls attention to its distinctness from that of *arcuata.* Article 27b of the International Rules of Zoological Nomenclature asserts that the law of priority obtains "When any stage in the life history is named before the adult."

Corythucha cratægi has been collected in the vicinity of Washington, D. C., upon the following plants: *Cratægus, Cephalanthus,* and *Amelanchier.*

Corythucha incurvata Uhler. *C. heteromelei* Heidemann ms. is a synonym.

Corythucha pallida Osborn and Drake. *Corythucha pallida* O. & D., op. cit., pp. 230–231. This species was described from

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* Ohio State Univ. Bulletin, 20, No. 35, June, 1916, pp. 229–230.

5 specimens taken on linden. It is the form which has gone for many years under the ms. name *adusta* Uhler, and is abundant on mulberry in the region about Washington, D. C. Uhler's name means "scorched," almost an opposite conception to that implied by the name now cited. The term *pallida* seems inept for a species distinguished by the clear brownish color of all the thicker membranous parts.

Corythucha pruni Osborn and Drake. *Corythucha pruni* O. & D., op. cit., pp. 231–232. The ms. name *cerasi* was used for this form by Uhler and Heidemann.

Corythucha bulbosa Osborn and Drake. *Corythucha bulbosa* O. & D., op cit., pp. 232–233. The food plant of this species, so long known under the highly appropriate ms. name *carbonata* Uhler, is *Staphylea trifolia.* The species is usually abundant.

Gargaphia angulata Heidemann. The most common food plant of this species does not seem to have been recorded. It is *Ceanothus americanus.*

Gargaphia amorphæ Walsh. *Tingis amorphœ* Walsh, Benj. D. On Phytophagic varieties and Phytophagic species. Proc. Ent. Soc., Phila., 3, 1864, p. 409.

This species is omitted from the recent Key to the Nearctic Species by Drake. (Drake, Carl J., Key to the Nearctic Species of Gargaphia with the Description of a New Species (Hem. Heter.). Ent. News, 28, No. 5, May, 1917, pp. 227–8.)

It runs to the section with broad costal area having 4 or more rows of areolæ at the widest part. In this group, *G. angulata* Heid. can be separated by absence of spines from back of vertex along inner orbits, and probably the genus should be primarily divided on this character. *G. solani* Heid. has the paranota wider and more angulate than either *tiliae* or *amorphae,* and the hood conspicuously higher than median carina. *G. amorphae* in some ways is intermediate between *solani* and *tiliae.* The hood is higher than median carina, but not so much as in *solani*, and in agreement with that species the apical angle of the discoidal area is at the outer side. In *tiliœ* the hood is lower than the median carina and the apical angle of discoidal area is about median. Counting the maximum number of rows of areoles in the parananota and discoidal areas, these three species have respectively: *tiliœ,* 4, 7; *solani,* 5, 5; and *amorphœ* 3 and 5.

NOTES ON SPECIES OF MIRIDÆ INHABITING ASH TREES (FRAXINUS) WITH THE DESCRIPTION OF A NEW SPECIES (HEMIP.).*

By Harry H. Knight, Ithaca, New York.

The writer has been gathering data on the life history and habits of Miridæ during the past three seasons and finds that the species breeding on ash trees are of particular interest. All the speceis of *Neoborus, Xenoborus* and *Tropidosteptes* are confined to ash trees (*Fraxinus*) as far as can be determined. Data is here given on the occurrence of certain species in New York with notes on the food habits and relative abundance of the species.

Tropidosteptes cardinalis Uhler. This species was found breeding only on the white ash (*Fraxinus americana*) and occurring in greatest numbers on the tender and succulent growth. The writer also noticed that the adults soon leave the place where they were reared and scatter to other more favorable growth for depositing eggs.

Records: June 7 to June 16, Ithaca, N. Y.; June 27, Honeoye Falls, N. Y.; June 12 to June 25, Batavia, N. Y.; July 4–5, Four Mile, N. Y., collected by the writer. June 20, Pine Island, New York (Wm. T. Davis).

Neoborus canadensis Van Duzee. This species was found on *Fraxinus americana* in company with *T. cardinalis* and *N. tricolor* on the Cornell Campus. The life cycle coincides very closely with that of *T. cardinalis* but is found only in favored spots.

Records: May 31 to June 16, Ithaca, N. Y.; June 20 to Aug. 24, Batavia, N. Y.; June 27, Portage, N. Y., collected by the writer.

Neoborus geminus Say. Occurs on *Fraxinus americana* in company with *amœnus* but found only during June and early July. In the large series collected by the writer certain specimens show a gradation into the dark forms of *amœnus* and thus the two may prove to be but varieties of the same species.

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* Contribution from the Department of Entomology of Cornell University.

Records: June 13 to June 28, Batavia, N. Y.; July 4–5, Four Mile, N. Y. (H. H. Knight).

Neoborus amœnus Reuter. Most abundant on *Fraxinus americana* and *F. pennsylvanica* and found sparingly on *F. nigra.* The species has two broods, the first adults maturing about June 20 in western New York and continuing on the trees up till frost or the middle of September.

Record: June 20 to Aug. 24, Batavia, N. Y.; Sept. 14, Wyoming, N. Y. (H. H. Knight).

Neoborus palmeri Reuter. This form has been regarded as a variety of *amœnus* but it is undoubtedly a good species. The writer has found it only on the black ash (*Fraxinus nigra*) and apparently coming earlier than *X. plagifer* and *X. commissuralis.*

Records: 5 ♀ July 30, 2 ♀ Aug. 6, Batavia, N. Y. (H. H. Knight).

Neoborus pubescens new species. Very similar to certain dark forms of *amœnus,* but distinguished from that and other species in the genus except *tricolor* by the presence of distinct pubescence.

Length 4.5–4.8 mm. Antennæ and legs pale. Head more sharply produced and the front more vertical and flattened than in *amœnus;* black, in the female the tips of the loræ and juga, each side of the median line on the front, pale. Pronotum with sides distinctly carinate only on the apical half; black, top of the collar, rather widely on the median line of the disk, one and sometimes two rays behind each callus, pale yellow; more coarsely punctured than in *amœnus.* Scutellum yellow, black at the middle of the base and on the mesoscutum; sternum and pleura black, orifice pale. Hemelytra pale, inner half of the clavus, along the claval suture, large apical spot on the corium and slightly invading the embolium, black. Membrane pale, in the female dark fuscous to black within the cells and margining the veins; in the male dark fuscous and extending to include the middle of the membrane. Venter black, sometimes paler in the female.

Holotype: ♂ July 23, Ithaca, New York (H. H. Knight); author's collection.

Allotpye: taken with the type.

Paratypes: 3 ♀ July 23, 1 ♂ 31 ♀ July 26, Ithaca, N. Y.; 2 ♀ Aug. 1, Batavia, N. Y., collected by the writer. 2 ♂ 1 ♀ June 15, Woodworth Lake, Fulton County, N. Y. (C. P. Alexander). ♀ July 3, Hanover, New Hampshire (C. W. Johnson).

The species was found only on the very young white ash plants which grew in shady and damp places, the leaves of which appeared to be infested by a mite.

Xenoborus pettiti Reuter. Breeds on *Fraxinus americana* and found in company with *T. cardinalis* and *N. canadensis:*

Records: May 31 to June 16, Ithaca, N. Y.; June 13 to June 30, Batavia, N. Y.; June 22, Portage, N. Y. (H. H. Knight).

Xenoborus neglectus new species. Resembles certain pale forms of *pettiti;* left genital clasper much longer and more spatulate toward the tip.

♂. Length 5.4 mm., width 2.1 mm. Black with pale. Antennæ fuscous, paler on the basal half of the first segment. Head with lower half of the face fuscous, front pale and flecked with reddish; carina and a small median dash at the middle of the vertex blackish. Pronotum ecarinate, punctuation and pubescence nearly as in *pettiti;* collar and large median spot or ray on the disk, white or pale yellow; pale ray from behind the calli extending along the margin of the disk and widening to the basal angles; scutellum pale yellowish, mesoscutum blackish. Hemelytra blackish, embolium, basal angle of the corium and entire cuneus, clear; membrane fuscous, in the female paler in the middle. Legs pale yellowish, the hind femora indistinctly marked with fuscous at the apices.

Holotype: ♂, June 17–20, Mud Creek, Tompkins Co., N. Y.; Cornell University Collection.

Allotype: June 18, Batavia, N. Y. (H. H. Knight).

The writer has found this species rather scarce though systematic collecting during June may show that it is present in greater numbers. The writer ventures to guess that it will be found on the black ash when that plant is thoroughly worked in June.

Xenoborus plagifer Reuter. The writer collected in the vicinity of Batavia for three seasons before taking this and the following species. It breeds only on the black ash (*F. nigra*) which grows in dense swampy woods. Once having found the food plant a large series was obtained by sweeping the host plant.

Records: ♂ July 30, 2 ♂ Aug. 1, 39 ♂♀ Aug. 6, ♀ Aug. 9, 5 ♂♀ Aug. 10, 27 ♂♀ Aug. 12, Batavia, N. Y. (H. H. Knight).

Xenoborus commissuralis Reuter. This pretty species was found on *Fraxinus nigra* in company with *plagifer* and was taken in greater numbers.

Records: 14 ♂♀ July 29, 123 ♂♀ July 30, 40 ♂♀ Aug. 1, Batavia, N. Y. (H. H. Knight).

STUDIES IN THE HYDNOCERINI (COL.). THE HYDNOCEROID GENERA.

By Edward A. Chapin, M.S.

After a careful study of a large collection of the insects heretofore included under the genus *Hydnocera* Newman, it has become evident that certain of the species differ from *H. pallipennis* Say, that species being the type of *Hydnocera,* to an extent which warrants the erection of genera to include them. In the characterization of the genus by Lacordaire (Gen. Col., IV, 471) the ungues are stated to be "appendiculate, their basal portion tooth-like."

In *Hydnocera pedalis* Leconte and its related species, *sobrina* Fall and *parviceps* Schaeffer, and in the group of species allied to *curtipennis* Newman (*longicollis* Ziegl.), the ungues are simple, but slightly thickened at the base. In these groups, however, the structure of the antennæ differs widely and considering the uniformity of structure as seen throughout the two large groups, the *pallipennis* and the *curtipennis* groups, a second division is made on the antennal characters.

The genera may be distinguished from one another by the following table:

Ungues with a broad basal tooth .... **Hydnocera** Newman.
Ungues simple, at most slightly thickened.
  Third segment of antennæ about twice as long as broad, cylindrical; prothorax much longer than broad .... **Isohydnocera** gen. nov.
  Third segment of antennæ as broad or broader than long; trapezoidal; prothorax subequilateral .... **Wolcottia** gen. nov.

Isohydnocera gen. nov.—Body very elongate; head short, vertical; eyes prominent, finely granulate, entire or minutely emarginate near antennal insertion; terminal segment of maxillary palpi cylindro-conical, that of labial palpi large, triangular; mandibles with a tooth near apex on the inside. Antennæ 11-segmented, first segment thick, moderately long and somewhat arcuate, second short, globose, third to ninth cylindrical, longer than broad, tenth very large, forming with the eleventh a compact club which is much thicker than the ninth segment. Prothorax distinctly longer than broad, nearly cylindrical, lateral dilation weak. Elytra broader than the thorax, shorter than the abdomen, attenuate or parallel and truncate, lateral margins and usually tips strongly serrate. Legs long and thin, tarsi with five segments, the first covered by the second from above, segments two, three and four bearing lamellæ beneath, ungues long and thin, simple. Type species: *Hydnocera curtipennis* Newman.

To this genus are to be assigned the following species: *I. curtipennis* Newman (*longicollis* Ziegl.), *tabida* Lec., *schusteri* Lec., *ornata* Wolc., *gerhardi* Wolc., *pusilla* Schaeff., *ægra* Newm., *brunnea* sp. nov., and *albocincta* Horn.

Isohydnocera brunnea sp. nov. Very elongate, form of *ægra* Newm. Brown, eyes black. Head sparsely and finely punctured, the punctures on the vertex being connected by fine grooves, surface otherwise smooth, very sparsely pubescent. Thorax much longer than wide (ratio of length to breadth is 40–32), apical transverse impression wide and shallow, basal deeper, section of thorax between impressions subglobose, lateral foveæ deep and distinct but small, surface except for a few punctures smooth, very slightly alutaceous toward hind angles. Scutellum brown, sparsely pubescent. Elytra elongate, suture nearly closed, apices very sharply truncate and tumid, lateral margins serrate, surface moderately densely and coarsely punctured, the punctures becoming more coarse toward apex, although nearly obsolete on the tumid portion of the tips. Pubescence sparse, erect and pale. Underparts brown, posterior halves of meso- and metapleuræ densely pubescent with pale hairs. Legs long and slender, the posterior tibiæ somewhat arcuate, brown. Length 4.8 mm.

Type locality: Riley Co., Kansas. Type in the collection of Kansas Agricultural College. This species is closely allied to *ægra* Newm. but is separated from that species by the nearly smooth thorax and by the different thoracic ratio. The thorax in *ægra* Newm. is finally alutaceous all over and has a ratio of

32 = 25.

Wolcottia gen. nov. Body elongate, slightly attenuate posteriorly. Head short, front flat, lateral margins slightly concave to accommodate eyes, which are not prominent, finely granulate and minutely emarginate as in *Isohydnocera*. Labrum broad, entire. Mandibles falciform, with a small internal tooth near apex. Terminal segment of maxillary palpi conical, as long or slightly longer than the preceding, that of the labial palpi very large, triangular. Antennæ short and stout, 11-segmented; first segment slightly longer than broad, second nearly spherical, third to eighth as long as broad, trapezoidal, becoming progressively broader, ninth broader than long, nearly as wide as tenth, tenth and eleventh forming an oval mass nearly as long as the three preceding segments. Thorax slightly broader than long, sides feebly dilated, slightly narrower than the head with eyes. Elytra at humeri broader than the head across eyes, attenuate posteriorly, tips rounded separately and with irregular margins. Legs long and thin, hind femora reaching beyond the tips of the elytra, tarsi of five segments, the first covered by the second from above, second, third and fourth bearing lamellæ beneath. Ungues long and thin, simple or but slightly thickened. Type species: *Hydnocera pedalis* Leconte.

The three species assigned to this genus, *W. pedalis* Lec., *sobrina* Fall, and *parviceps* Schaeffer, have antennæ which seem to be midway between the three-segmented club type of *Lemidia* Spinola and the two-segmented club type of *Hydnocera* Newman. This genus is dedicated to Mr. Albert B. Wolcott, Chicago, Ill., the recognized authority on North American Cleridæ. I wish to thank Mr. Wolcott for his unbounded generosity in placing at my disposal his entire collection of these genera, but for which I should have been unable to make the observations recorded above. Thanks is also due Dr. J. H. Merrill, of Kansas Agricultural College, for the use of the Clerid material of that institution.

THREE NEW CHALCID FLIES FROM NORTH AMERICA.

By A. A. Girault, Glenn Dale, Md.

Elachistus sanninoideæ new species.

Female: In the table of species runs to *hyphantriæ* Crawford but differs in that all the coxæ are black, the abdomen is entirely black except slightly above at base and the mandibles are dentate (six teeth). Scape dusky at tip, the flagellum black. Club 2-jointed, not nippled. The male is similar but the yellow area on the abdomen is distinct (basal fourth except the margins) and the scape is concolorous and foliaceously dilated ventrad.

One male, four females reared from the pupa of *Sanninoidea exitiosa* at Fayetteville, Arkansas, July 23 (G. Becker).

Types: Catalogue No. *20758*, U. S. National Museum, one male, four females on tags, a male and female head and female hind legs on a slide.

Secodes multilineatus new species.

Female: Similar to *Secodella viridis* Crawford but smaller by a half and the tips of the tibiæ are plainly white, the knees narrowly so, the scutellum is shorter, funicles 1–2 subequal, each only somewhat longer than wide, the mandibles tridentate.

Two females, U. S. (3126^{03} of the Bureau of Entomology, June 30, 1883).

Types: Catalogue No. *20771*, U. S. National Museum, the two females on tags, their heads on a slide.

Ootetrastichus gibboni new species.

Female: Length, 1.30 mm. Ovipositor extruded somewhat. Slender, the abdomen conic-ovate, longer than the thorax. Second ring-joint very short, the others large, subequal. Dark metallic green, the wings hyaline, the mouth distinctly, legs, tegulæ, scape except immediate base and along dorsal edge, pedicel except above at basal two thirds, lateral margin broadly but obscurely of the large postscutellum and proximal third of the abdomen, above and below except the margins broadly above, dull yellow. Funicle 1 about five times longer than wide, longest, 2 subequal to the elongate pedicel, over twice longer than wide, 3 a little shorter than 2. Club usual, its terminal nipple distinct, short. Sculpture usual, very fine. Punctures along lateral margin of scutum minute; propodeum with a median carina only, the caudal margin carinated. Mandibles as in *mymaridis* as to shape.

Five females associated with *Languria mozardi,* Tempe, Arizona, Sept., 1912 (V. L. Wildermuth).

Types: Catalogue No. *20787*, U. S. National Museum, four females on tags, a head and several antennæ on a slide.

NEW CHALCID FLIES, WITH NOTES.

By A. A. Girault, Glenn Dale, Md.

Eurydinota lividicorpus n. sp.—Female: Length 1.65 mm. Dark metallic blue, the wings hyaline, the base and apex of the tibiæ and tarsi white. Clypeus striate, gently concave at apex. Head and thorax punctate. Propodeum with distinct, curved lateral carina and no other, the carina forming the lateral rim of the large neck, no spiracular sulcus, the spiracle elliptical, cephalad. Petiole a little longer than wide. Parapsidal furrows half complete from cephalad. Abdomen depressed, delicately scaly distad, segment 2 occupying a fourth of the surface, its caudal margin convex, entire. Antennæ inserted somewhat above the ends of the eyes, the scape slender, reaching to the top of the vertex; pedicel twice longer than wide at apex, much longer than any funicle joint; ring-joints unequal; funicle 1 (a ring-joint?) quadrate, narrower than the following joints; 2 and 3 subquadrate, wider than 1, 6 twice wider than long. Stigmal vein long and slender, slightly shorter than the marginal which is slightly shorter than the postmarginal.

The male is similar but funicle 1 is wider than long, still more like a ring-joint, the pedicel shorter; also the cephalic tibiæ are reddish yellow.

From several pairs reared from *Coleophora malivorella,* Walnut Creek, Cal., June 7, 1916 (W. M. Davidson). Types: Cat. No. 20,971, U. S. Nat. Mus., one male, three females on tags, a female head and hind legs on a slide. Also at San Jose (Moulton, 1909), Los Angeles (Coquillett), and Mountain View (Ehrhorn), Cal.

Gonatocerus titillatus n. sp.—Female: Like *maga* Girault but the fore-wings are subhyaline, nearly the basal half of the abdomen is yellow (above this yellow with three cross stripes, the first well out from base), the legs are yellow except coxæ and femora (the latter except at apex), the funicle is of uniform width, the club slender, funicle 1 over twice longer than wide, 2 and 3 subequal, longest, over thrice longer than wide, 7 nearly as long as either, the others subequal, twice longer than wide and subequal to the pedicel. Longest marginal fringes of fore-wing somewhat less than half the width of those wings. Thorax scaly, the propodeum subglabrous, non-carinate. Ovipositor extruded for a sixth the length of the conical abdomen which is distinctly longer than the thorax.

One female, Salt Lake, Utah, from a window (C. N. Ainslie). Type: Cat. No. 20,972, U. S. Nat. Mus., the female on a slide.

Ormyrus unfasciatipennis n. sp.—Female: Length 2.70 mm. Like *unmaculatipennis* but the fuscous area on the fore-wing is continued across the wing and widens caudad; the legs are entirely metallic except the tarsi and the knees and tips of tibiæ more or less broadly, cephalic legs washed with metallic only; the antennæ are wholly metallic except the scape more or less at each end and ventrad; and the punctures on the abdomen are in triple rows, the first line in each row at first incomplete.

Described from one female in the U. S. Nat. Mus. from Los Angeles Co., Cal. (Coquillett). Types: Cat. No. 20,975, U. S. Nat. Mus., the above female minutien mounted.

Ormyrus thymus n. sp.—Female: Similar to *unmaculatipennis* except that the antennæ and legs are entirely metallic green except the reddish brown tarsi, the spot on the fore-wing is longer than wide, obliquely truncate distad and widens distad, extending a little beyond the middle, the median carina on the abdomen is obscure and the lines of punctures single except in places.

From one female in the same collection, Mountain View, Cal. (Ehrhorn). Type: Cat. No. 20,976, U. S. Nat. Mus., the specimen on a tag.

Omphalomopsis gen. n.—Female: Placed provisionally in the Tetrastichini and agrees with *Ootetrastichus* Perkins but the thorax has no grooves and the marginal fringes of the fore-wing are long. Three ring-joints. Propodeum with a median carina, moderately long. Flagellum with sparse, moderately long, pale hair. Mandibles tridentate, 3 truncate. Resembles *Thripoctenus.* Ovipositor extruded for a short distance.

Omphalomopsis marilandia n. sp.—Female. Genotype. Length 0.90 mm. Dark metallic purple, the wings hyaline, the legs, antennæ and proximal third of abdomen pale yellow. Hind coxæ concolorous. Tegulæ yellowish. Sculpture very fine and velvety. Funicles 1–3 subequal to each other and to the pedicel, over twice longer than wide, club 1 somewhat shorter, 2 longest of the flagellum, nippled at apex. Marginal fringes of the fore-wing somewhat over a third that wing's greatest width. Abdomen spatulate, a little longer than the thorax.

One female (Hillmead), Glenn Dale, Md., 1916, Sept. Type: Cat. No. 20,973, U. S. Nat. Mus., the female on a tag, the head on a slide.

Aprostocetus kansasia n. sp.—Female: Like *diplosidis* Crawford, but dark metallic, the propodeum is longer, the abdomen acuminate, funicle 1 over twice the length of the pedicel, over thrice longer than wide, 3 much over twice longer than wide. Types compared.

One female, Riley Co., Kan. (J. B. Norton). Type: Cat. No. 20,977, U. S. Nat. Mus., the specimen on a tag, the head on a slide.

Telenomus fuscicornis Ashmead.—Differs from female *monilicornis* Ashm. only in the flatter scutellum which is twice wider than long (not so in the other) and the wider post-scutellum which is finely long-striate in both but in *fusicornis* is twice wider than long. Types compared (male of *monilicornis* with female specimen from Porto Rico and a female type of the other).

In this species the mesonotum and vertex are finely scaly, the latter pilose, the scutellum polished. The legs may be entirely black. Segment 2 of abdomen is somewhat longer than wide. Funicle joints 3 and 4 are equal, globular, and smaller than 1 or 2.

Four females from eggs of a moth which feeds upon *Crotolana retusa.* St. Vincent, B. W. I. (S. Cross Harland).

Coccophagus orientalis Howard. This is an *Aneristus* allied very closely with *fumosipennis* Girault. Types examined.

Eurytoma pissodis n. sp.—Female: Exactly similar to the type of *cleri* Ashm., except as follows: all the coxæ are black, the hind femur is black (usually) laterad and along the dorsal edge at distal half, the hind tibia black except at each end; the tegulæ are black; the abdomen is entirely black; the stigmal vein is barely shorter than the postmarginal, the median basin of the propodeum bears fine cross-rugæ which are continuous (not so in the other but variable in both); the ventral half of the prepectus is not rugulose but near caudal margin has a cross-row of foveæ; the middle section or finely punctate portion of the mesopleurum is larger (a third wider), as wide as the third or caudal or the section with cross-rugæ; the propodeum and prepectus are wholly black; and the abdomen from above is finely scaly after segment 2 (not until after 4 in the other). A variety has black spots above on the first two pairs of femora, the cephalic tibiæ are black centrally dorsad, the middle tibiæ wholly black.

The male is similar except that the scape is black. Petiole twice longer than wide; funicle 5-jointed.

From two males, seven females taken from the pupal chambers of *Pissodes strobi* in September, 1916, as larvæ and reared several months later. Taylor's Falls, Minn. (S. A. Graham). Types: Cat. No. 20,969, U. S. Nat. Mus., one male, four females on four tags.

In New York it appears as an adult in May.

THREE NEW SPECIES OF THE NEW GENUS ANDRENA FROM THE UNITED STATES (HYMENOPTERA, ACULEATA).

By J. R. Malloch, Urbana, Ill.

The three species described in the present paper are probably represented in other collections, and it is quite possible that *regularis* is confused with *carlini* or even with *vicina* in collections from the eastern states.

Andrena banksi n. sp. *Male*.—Black, clypeus lemon-yellow. Head shining, glossy behind eyes and on lower part of face; antennæ subopaque. Thorax subopaque, slightly shining on posterior half of pleuræ. Abdomen glossy. Surface hairs grayish, or those on disc of thorax slightly yellowish.

Head distinctly broader than high; clypeus glossy, flattened, and almost impunctate on center of disc, the punctures becoming more numerous and much closer towards each lateral angle; anterior central outline of clypeus broad, regularly arcuate, the length across equal to that from its outer angle to base of mandible; mandibles long and curved, inner tooth small, well removed from apex, no tooth at base on under side; cheek broader than eye, produced opposite middle of eye into a more or less tooth-like process which projects backward, but rarely reduced, appearing as an angular production of the posterior margin which is more or less accentuated by the presence of a slight concavity at base on its lower margin. Thorax throughout finely and closely shagreened, and indistinctly punctate. Abdomen much less closely shagreened than the thorax, the only punctures present being those at the bases of the rather long, sparse surface-hairs;

fasciæ at apices of segments very faint, distinguishable only laterally; hairs on segments 1 and 2 very much longer than those on other segments; sixth ventral segment slightly reflexed apically but without lateral angles; seventh with a deep wedge-shaped notch in center of the median produced portion; eighth very similar to that of *erythrogastra,* terminating in a long, almost parallel-sided process, the apex of which is truncate or slightly rounded; hypopygium somewhat similar to that of *andrenoides,* differing in having the dorsal processes of the stipites broader, longer, and more nearly truncate apically, and closely contiguous almost to their apices.

Female.—Differs from the male in having the face entirely black, the thoracic hairs bright fulvous, and the apices of the abdominal segments each with a complete band of whitish hairs.

Foveæ broad, at upper extremity covering about four fifths of space between eye and ocellus, pubescence tawny yellow, lower extremity of foveæ below lower level of antennal insertion; clypeus shagreened and rather remotely and finely punctate except on lower median portion, clypeal structure as in male; mandibles shorter and stouter than in male; malar space about one fifth as high as broad; cheek broader than eye, tapered below and without a distinct angle; basal flagellar joint slightly shorter than 2 + 3. Thorax as in male; metathoracic enclosure minutely shagreened, basally irregularly granulose. Surface hairs stout, dense, and upright, covered with closely appressed short branches and except under a high magnification appearing simple. Abdomen as in male, the punctures at bases of the upright hairs even less distinct, so that the surface appears impunctate; hairs on segments 1 and 2 long and upright; fascia on segment 1 less distinct than on others; pygidium truncate and slightly emarginate at apex. Mid and hind metatarsi narrower than corresponding tibiæ; hind tibiæ broad, of nearly an equal width on their apical three fifths, gradually narrowed to base on remainder; tarsal claws bifid, the inner tooth much shorter than outer. Greatest length of third submarginal cell at least twice that of second; basal nervure distinctly distad of transverse median.

Length: male, 8.5–9.5 mm.; female, 11.5–12.5 mm.

Type locality, Fedor, Texas, March 13–24 (Birkmann). Paratypes, Trinity, Texas, March 20, 2 males on *Salix* (R. A. Cushman); Beaumont, Texas, March 18 (E. S. Tucker); Great Falls, Maryland, April 21 (N. Banks); Maryland, near Plummers Island, April 19, 21, 22, 7 males on flowers of *Prunus* (L. O. Jackson, H. L. Viereck).

The male of this species is separable from that of any described species by the yellow clypeus and peculiar tooth-like projection of the posterior margin of cheek. The female resembles in some respects *mandibularis* Robertson, but the stout, dense thoracic hairs, complete abdominal fasciæ, and many minor characters readily distinguished the species.

Named in honor of Nathan Banks, who submitted the first examples of the species which I had seen.

Type and allotype in collection of Illinois State Laboratory of Natural History; paratypes in collections of Nathan Banks and U. S. Bureau of Biological Survey.

Andrena regularis n. sp. *Male.*—Black, distinctly shining. A few brownish black hairs along inner margins of eyes, on vertex, and behind upper angle of eyes, remainder of hairs of head, those of thorax, and those of abdomen whitish gray. Legs black, hairs whitish except on under surfaces of basal tarsal joints and inner surface of hind tibiæ, where they are brownish. Wings slightly brownish on apices, veins yellow.

Head about one seventh broader than high; third antennal joint one fourth longer than fourth and subequal to fifth; clypeus glossy on disc, shagreened on margins, discal punctures of moderate size, very regularly distributed, no impunctate ventral line present; cheek distinctly broader than eye, rounded posteriorly; malar space narrow, punctate; mandibles long, curved, simple at base, with a weak preapical inner tooth; process of labrum truncate, rather broad. Thoracic hairs long and rather dense; metathoracic enclosure finely rugose. Abdomen with sparse, fine punctures and short, upright hairs; apical ventral segment tapering on its apical two thirds, with a rather sharp ventral production at one third from apxe, and from this point caudad covered with dense hairs, apex stout, slightly fishtail-shaped; hypopygium stout, dorsal processes of the stipites stout, contiguous nearly to their apices, then widely and suddenly diverging, terminating in a rounded point.

Female.—Very similar to *carlini* Cockerell, differing in having the clypeus with small, rather widely spaced, regular punctures.

Head with pale hairs on center of face and behind vertex, remainder of surface with brownish to black hairs. Dorsum of thorax and upper half of pleuræ with long pale hairs, remainder of surface with black hairs. Abdomen with black hairs which are short except at apex. Hairs of legs black, femoral hairs sometimes pale. Wings as in male.

Clypeus much less conspicuously punctured than in male; foveæ broad, descending below lower margins of antennal sockets, narrowly separated from eyes. Metathoracic enclosure granulose except at base. Scopæ of hind tibiæ simple on outer side; tarsal claws long, bifid. Otherwise as male.

Length: male, 10–12 mm.; female, 12–14 mm.

Type locality, Ithaca, N. Y., April 26 to June 6. A very large series of both sexes submitted by Dr. J. C. Bradley from Cornell University collection. Type and paratypes in the latter collection; paratypes in collection of Illinois State Laboratory of Natural History and of U. S. Bureau of Biological Survey.

The female of this species closely resembles that of *carlini* but is readily separated from it by the regularly punctate clypeus.

Andrena flexa n. sp. *Female.*—Black, shining. Hairs on lower margin of clypeus brownish, remainder of hairs on head and thorax yellowish white, abdominal fasciæ white, dense, interrupted centrally; hairs on legs whitish or yellowish, those on base of hind tibiæ, above, brownish. Legs brownish black. Wings slightly brownish, especially at apices; veins dark brown.

Head about one fifth broader than high; foveæ whitish, tapering to a point slightly below lower margin of antennal sockets and narrowly separated from eyes; clypeus shining, with subcontiguous, deep punctures and a distinctly elevated median impunctate linear space; malar space linear except posteriorly, impunctate; back of head about 1.5 times as broad as eye; labrum truncate apically, sides convergent; mandibles short and blunt, simple. Dorsum of thorax closely punctured; metathoracic enclosure broad, granulose. Abdomen densely punctate, the punctures small and deep. Hind tibial scopæ simple outwardly; claws bifid; hind tibiæ with the inner spur distinctly flexed at about one third from apex. Venation normal.

Length, 9.5–10.5 mm.

Type locality, Dubois, Ill., May 15, 1916, and May 24, 1917 (C. A. Hart and J. R. Malloch). On flowers of raspberry and *Cratægus.*

This species bears a striking superficial resemblance to *cressoni* Robertson, but may be readily separated from it and from all other species known to me by the flexure of the hind tibial spur.

The male is unknown to me.

Type and paratypes in coll. Ill. State Lab. Nat. Hist., paratype in U. S. Bur. Biol. Surv.

BUPRESTIDÆ AND CERAMBYCIDÆ FROM MAINE.

By Alan Sloan Nicolay, Brooklyn, N. Y.

From May 1 to the middle of July, 1916, I was in Douglas Hill, Maine, able to collect from morning until night. It is in Cumberland County, elevation about 1,200 feet, three miles from

Lake Sebago and about thirty miles from Portland, hilly, but not mountainous, with an abundance of pine and white birch, oak conspicuously absent. Numerous portable saw mills, while not adding to the beauty of the country, were great aids to the specialist in Buprestidæ and Cerambycidæ.

With the exception of the common *Rhagium lineatum,* taken as early as May 1, there were no captures in the two families until about May 15. Snow was still to be seen in shaded valleys. May 15 I took my first specimen of the rare *Anthophilax malachiticus,* and from then collecting was excellent, reaching its best during the last week in June. The list of captures:

Chalcophora fortis Lec. July 13 a single one flying along shore of Lake Sebago.

C. virginiensis var. *lacustris* Lec. June 7–July 12. Not rare. Taken almost every favorable day on the trunk of a dead but still standing pine. None from prostrate logs.

C. liberta Germ. June 28–July 13. All but one flying over Lake Sebago July 13, a very warm sunny day. Would light on bath houses and be easily picked off.

Dicerca divaricata Say. June 22.

D. divaricata var. *caudata* Lec. July 9.

D. prolongata Lec. Two specimens June 2–26.

D. punctulata Sch. June 26. Not common.

D. tenebrosa var. *chrysea* Melsh. June 24–July 6. Half a dozen on dead standing tree trunks. None from fallen logs.

Buprestis striata var. *impolita* Say. This is the green form, which is northeastern. The true *striata* is uniformly coppery brown and ranges from New York to Florida.

Melanophila fulvoguttata Harris. June. Very abundant

Chrysobothris dentipes Germ. June. Common on pine logs.

C. scabripennis Lap. & Gory. June. Occurs with *dentipes,* even more abundant, but very active and hard to catch.

C. harrisii Hentz. June 2–July 6. This beautiful species quite locally common, lighting on the smaller twigs of fallen pines. Very active, seen only on sunny days.

Agrilus acutipennis Mann. June 28. Two specimens.

A. ruficollis Fab. June–July.

A. politus Say. July 11.

A. vittaticollis Rand. July 8. One beautiful specimen taken sweeping.

Asemum moestum Hald. Common May–June.

Phymatodes variabilis Fab. Common June–July.

Callidium antennatum Newm. May 21. One specimen.

C. janthinum Lec. June 25–July 15. Common.

Molorchus bimaculatus Say. May 22.

Clytus marginicollis Lap. June 19–21. Three taken, as many more seen. This species was very active running in bright sunlight on branches of fallen pines, taking flight when approached.

Xylotrechus fuscus Kirby. July 11. Sparingly.

Neoclytus muricatulus Kirby. July 6. One pair on pine.

Clytanthus ruricola Oliv. July 11.

Euderces picipes Fab. June 18–July 15. Common on flowers.

Desmocerus palliatus Forst. July. Common on elder.

Encyclops cœruleus Say. July 14. One female knocked from dead cedar needles.

Rhagium lineatum Oliv. May–June. Very common. They would run over pine logs and stumps in the bright sunlight, not unlike lizards in habit, action and appearance.

Pachyta monticola Rand. May 21–28. Several from blossoms of wild cherry and by beating dead pine needles.

P. rugipennis Newm. June 18. A single specimen of this rarest of rare beetles found resting on a small twig of a linden by the roadside. It is undoubtedly a pine feeder. It remained in the cyanide bottle all the afternoon, then pinned, and next morning it was still very much alive.

Anthophilax malachiticus Hald. May 15–June 14. Beaten from half dead pine needles from tops of trees felled the previous winter. Eight altogether, three May 18.

A. alternatus Hald. May 25–June 5. Mostly flying on warm days throng the woods; one beaten from dead pine needles.

Acmaeops proteus Kirby. June 14–21. Not common, beating dead pine needles.

Gaurotes cyanipennis Say. June 29 on flowers.

Leptura hœmatites Newm. June 7.

L. exigua Newm. June 3.

L. cordifera Oliv. July 8–12. Common on flowers.

L. proxima Say. July 8–13.

L. vittata Germ. July.

L. pubera Say. June 19–July 9.

L. ruficollis var. *sphæricollis* Say. June 29.

L. mutabilis Newm. June 5–July 1. Common.

L. aspera Lec. June 22. One specimen.

Monohammus scutellatus Say. May 29–June 28. Very common around fallen pine logs.

Letpostylus 6-guttatus Say. July 6.

Hyperplatys aspersus Say. July 9.

Pogonocherus plenicellatus Lec. May 29–June 29. Not rare, about 16 beaten from dead cedar.

Eupogonius tomentosus Hald. June 24.

Saperda vestita Say. July 14. At light.

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BULLETIN
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THE NORTH AMERICAN WASPS OF THE SUBGENUS PEMPHREDON LATREILLE.

By S. A. Rohwer, Specialist in Forest Hymenoptera, Bureau of Entomology, U. S. Department of Agriculture.

The North American species of *Pemphredon* as treated by Fox, Trans. Amer. Ent. Soc., Vol. 19, 1892, p. 307, may be divided into two well-defined subgenera. The first subgenus has a recurrent vein in both of the cubital cells and is *Pemphredon* in the strict sense. The other subgenus has both recurrent veins received by the first cubital cell and is *Diphlebus* Westwood. Morice and Durant contend that the name *Pemphredon* should fall as a synonym of *Cemonus* Jurine. According to the rulings of the International Commission of Zoölogical Nomenclature, the genus *Pemphredon* was founded in 1796 by Latreille and antedates *Cemonus*.

In this synopsis only the species of the subgenus *Pemphredon* are tabulated. *Pemphredon provancheri* Ashmead and *Pemphredon tinctipennis* Cameron are not included. The unsatisfactory description of *provancheri* makes it difficult to form a definite idea of this species and there is nothing in the collection which agrees well enough to be considered as that species. Judging from the description, *Pemphredon tinctipennis* Cameron is a valid species and is different from any of the species in the collections available.

The nests of the species of the genus *Pemphredon* are as a rule made either in brashy wood or in the old galleries of wood-boring larvæ and are provisioned with paralyzed flies.

KEY TO THE NEARCTIC SPECIES.

1. Males .... 2.

Females .... 10.

2. Flagellar joints four to eight produced beneath .... 3.

Flagellar joints simple .... 6.

3. Enclosed area of propodeum flat and uniformly longitudinally striate 4.

Enclosed area of propodeum depressed basally, the base with longitudinal rugæ, the apical part shining .... 5.

4. Petiole slightly longer than the hind basitarsis; head seen from above with anterior width distinctly less than twice the length, not narrowing distinctly behind the eyes .... *rileyi* Fox.

Petiole slightly shorter than the hind basitarsis; head seen from above with the anterior width nearly as great as the length, distinctly narrowing behind the eyes .... *errans* Rohwer.

5. Distance between the eyes at the clypeus distinctly greater than the length of the eye; vertex with distinct although scattered punctures, *confertim* Fox.

Distance between the eyes at the clypeus subequal with the length of the eye; vertex practically impunctate .... *cockerelli* Rohwer.

6. Propodeal enclosure longitudinally striate; anterior margin of the clypeus tridentate .... *nearticus* Kohl.

Propodeal enclosure rugose; anterior margin of the clypeus arcuately emarginate .... 7.

7. Head seen from above with the cephalo-caudad length distinctly more than half the anterior width; petiole distinctly longer than hind basitarsis .... *concolor* Say (Fox).

Head seen from above with the cephalo-caudad length less than or subequal with the anterior width; petiole subequal with the hind basitarsis .... 8.

8. Propodeum with a more or less distinct, U-shaped, finely aciculate ridge defining off the more coarsely rugose area; mesoscutum with close punctures anteriorly .... *angularis* Fox.

Propodeum without a U-shaped ridge .... 9.

9. Distance between the eyes at the clypeus distinctly greater than the length of the eye; scutum transversely striato-punctate; ocellocular line nearly twice as long as the postocellar line ..... *shawii* Rohwer.

Distance between the eyes at the clypeus slightly less than the length of the eye; scutum shining, sparsely punctured; ocellocular line but little longer than the postocellar line .... *virginiana* Rohwer.

10. Basal dorsal area of the propodeum with distinct longitudinal carinæ 11.

Basal dorsal area of propodeum rugoso-reticulate .... 13.

11. Anterior margin of the clypeus strongly biemarginate or tridentate; scutum shining, sparsely punctured .... *nearcticus* Kohl (Fox).

Anterior margin of clypeus not biemarginate; scutum transversely rugulose .... 12.

12. Anterior margin of the clypeus deeply, arcuately emarginate; scutum finely rugulose and with a few scattered punctures.......*rileyi* Fox.
 Anterior margin of the clypeus subtruncate with a median tooth; scutum rather coarsely punctato-rugulose ....*errans* Rohwer.
13. Anterior margin of the clypeus deeply biemarginate or tridentate; scutum with distinct rather large punctures ....*foxii* Rohwer.
 Anterior margin of the clypeus truncate or somewhat produced; scutum rugulose or punctato-rugulose .... 14.
14. Basal dorsal middle of propodeum coarsely rugo-reticulate, separated from the rest of the propodeum by a U-shaped area which is finely aciculate; anterior margin of the clypeus produced into an angle; scutum with fine, curved wrinkles ....*angularis* Fox.
 Propodeum without a U-shaped area; clypeus different .... 15.
15. Anterior margin of clypeus subtruncate, without a median tooth or lateral angles; scutum punctato-rugulose; third antennal joint fully one third longer than fourth ....*concolor* Say (Fox).
 Anterior margin of clypeus truncate, with a median tooth and with lateral angles of truncation prominent, so there is an indication of being tridentats; scutum punctato-rugose. third antennal joint about one fourth longer than fourth ....*virginiana* Rohwer.

Pemphredon errans new species.—*Pemphredon rileyi* Fox, Trans. Amer. Ent. Soc., Vol. 19, 1892, p. 310. Male, not female.

The male which Fox associated with the female he described as *rileyi* is the male of one of the females which he wrongly placed under this species. Of the specimens originally placed under *rileyi* by Fox only one of them, the holotype female, really belongs there. The others are a new species and are described herewith. The description of the female given by Fox was, at least for the greater part, taken from the holotype.

Female.—Length 7 mm. Clypeus flat, shining, with large, rather close punctures, the anterior margin subtruncate with a small median tooth and rather prominent lateral angles; distance between the eyes at the clypeus somewhat greater than the length of the eye; front punctato-aciculate; posterior orbits and vertex shining, sparsely punctured; seen from above the anterior width of the head is not twice as great as the cephalo-caudad length; head not markedly narrowing behind eyes; ocellocular line one half longer than the postocellar line; third antennal joint one third longer than the fourth; scutum with a median depression anteriorly where the curved striato-punctations meet; scutellum sparsely punctured; dorsal basal area of propodeum flat, with uniform longitudinal striæ which become weaker posteriorly; sides and posterior face (except the median channel) aciculato-punctate; petiole not strongly sulcate laterally, much shorter than the hind basitarsis. Black; wings hyaline, with radial area somewhat dusky.

Male.—Length 7 mm. Clypeus flat, closely punctured, the anterior margin with a median emargination; distance between the eyes at the clypeus distinctly greater than the length of an eye; front closely punctured, some of the punctures confluent; posterior orbits and vertex shining with rather close punctures; seen from above the anterior width of the head is nearly twice as great as the cephalo-caudad length; head distinctly narrowing behind eyes; ocellocular line nearly twice as long as the postocellar line; third antennal joint distinctly longer than the fourth; antennal joints 6–9, distinctly produced beneath; scutum shining, sparsely punctured and with a few oblique wrinkles; otherwise as in female.

Type Locality.—Monterey County, California, one female in April; allotype and one paratype male from San Mateo County, California, in March; paratype female Placerville, California, reared from an oak gall by F. B. Herbert.

Type.—Cat. No. 21562 U. S. Nat. Mus.

Pemphredon rileyi Fox.—Type: Cat. No. 1884 U. S. Nat. Mus. Female.

Type Locality.—Placer County, California, September (A. Koebele). See remarks under *errans* Rohwer.

Male.—Length 8.5 mm. Clypeus flat, with fine, close punctures, the anterior margin with a median emargination; distance between the eyes at the clypeus distinctly greater than the length of the eye; front closely, sometimes confluently punctured; posterior orbits and vertex shining with separate distinct punctures, seen from above the anterior margin of the head is not merely twice as wide as the cephalo-caudad length, scarcely narrowing behind the eyes; ocellocular line about one half longer than the postocellar line; third antennal joint distinctly longer than the fourth; antennal joints 6–9 prominent beneath; scutum punctato-striate anteriorly, sparsely punctured posteriorly; scutellum striato-punctate; propodeum like *errans*; petiole distinctly sulcate laterally, longer than the hind basitarsis. Black; wings hyaline, faintly smoky.

Described from two males from Pyramid Ranger Station, California, collected on *Sambucus glauca* by F. B. Herbert, August 20, 1915.

Pemphredon cockerelli Rohwer.—*Pemphredon cockerelli* Rohwer, Trans. Amer. Ent. Soc., Vol. 35, 1909, p. 103.

This is a male and not a female, and is allied to *confertim* Fox.

Pemphredon angularis Fox.—A female collected on the campus of the University of Colorado at Boulder by T. D. A. Cockerell.

Pemphredon shawii new species.—*Male.*—Length 8 mm. Clypeus convex, subopaque, with sparse, well-defined punctures, the anterior margin depressed, with a deep, arcuate, median emargination; the distance between the eyes at the clypeus much greater than the length of the eye; frons opaque with close, sometimes confluent punctures; posterior orbits punctured similar to but more sparsely than the front; seen from above the head is much wider anteriorly than it's cephalo-caudad length and distinctly converges posteriorly; vertex shining with sparse, well-defined punctures; postocellar line a little more than half as long as ocellocular line; the third antennal joint about one fifth longer than the fourth; mesoscutum subopaque, with a median depression anteriorly towards which the oblique striato-punctation converges; posterior margin of the scutum shining; scutellum shining, punctured; dorsal aspect of the propodeum rugose anteriorly, rugoso-granular posteriorly, sides reticulate; petiole a trifle shorter than the hind basitarsis. Black, densely clothed with long gray hair; wings hyaline, distinctly dusky beyond the basal vein; venation pale brown, costa and stigma dark brown.

Type Locality.—Hampton, New Hampshire. Described from one male collected June 28, 1905, by S. A. Shaw, for whom the species is named.

Type.—Cat. No. 21563, U. S. Nat. Mus.

Pemphredon foxii new species.—This species has been confused with *concolor* by Fox, but the characters given in the above table show that it is easily separated from that species by the puncturation of the scutum and the different conformation of the anterior margin of the clypeus.

Female.—Length 10 mm. Clypeus subconvex, polished, with widely separated distinct punctures, the anterior margin deeply biemarginate or tridentate with subequal teeth; distance between the eyes at the clypeus somewhat greater than the length of the eye; front shining, medianly sparsely punctured, laterally, the punctures become confluent so there is distinct tendency towards striato-punctation; posterior orbits and vertex polished, with small scattered punctures; seen from above the width of the anterior margin of the head not more than one half greater than the cephalo-caudad length; head not receding behind the eyes; postocellar line about one fourth shorter than the ocellocular line; third antennal joint distinctly longer than the fourth; scutum shining with large close punctures; scutellum with close, sometimes confluent punctures; base of the propodeum depressed, coarsely rugose, the superior posterior angles shining, obliquely rugulose, the sides and posterior face reticulate; petiole strongly sulcate laterally, subequal with the length of the posterior basitarsis. Black; head, thorax and petiole with long black hair; wings dusky hyaline, venation pale brown, costa and stigma dark brown.

Type Locality.—Camden County, New Jersey. Described from one female collected July 27, 1890. Named for W. J. Fox.

Type.—Cat. No. 21564, U. S. Nat. Mus.

Pemphredon virginiana new species.—*Female.*—Length 10 mm. Clypeus flat, shining, sparsely punctured, the anterior margin truncate with a median tooth and prominent lateral angles so it appears feebly tridentate; distance between the eyes at the clypeus subequal with length of an eye, front sparsely punctured medianly, striato-punctate laterally; posterior orbits and vertex shining, sparsely punctured; seen from above the anterior width of the head is not nearly twice as great as the cephalo-caudad length; head not narrowed behind the eyes; postocellar line about half as long as the ocellocular line; third antennal joint one fourth longer than the fourth; scutum coarsely punctate with some of the punctures confluent; scutellum striato-punctate; basal dorsal area of propodeum depressed; rugose, the sides and posterior face reticulate; petiole not sulcate laterally, subequal in length to the hind basitarsis. Black; wings hyaline, the radial area somewhat dusky.

Male.—Length 8.5 mm. Clypeus flat, closely punctured, the anterior margin with a median emargination; distance between the eyes at the clypeus distinctly less than the length of an eye; front and vertex sculptured like female; seen from above the anterior width of the head is twice as great as the cephalo-caudad length; head distinctly narrowing behind the eyes; flagellum simple; the third antennal joint one fourth longer than the fourth; scutum shining, with large separate punctures; scutellum and propodeum as in female; petiole subequal with the hind basitarsis. Color as in female.

Type Locality.—Falls Church, Virginia. Described from three females and five males reared from a decaying tulip stump by William Middleton.

Type.—Cat. No. 21565, U. S. Nat. Mus.

LIST OF THE NEACTIC SPECIES OF PEMPHREDON LATREILLE SENSU LATORE

angularis Fox.
bipartior Fox = Diphlebus.
cockerelli Rohwer.
concolor Say (Fox).
concolor Provancher (not Say) = provancheri Ashmead.
confertim Fox.
errans Rohwer.
foxii Rohwer.
giffardi Rohwer = Diphlebus.
grinnelli Rohwer = Diphlebus.
harbecki Rohwer = Diphlebus.
inornatus Say (Fox) = Diphlebus.
marginatus Say—probably Passaloecus.
montanus Dahlbom—a European species recorded from British Columbia by Kohl.
morio Cresson = concolor Say (Fox).
nearcticus Kohl.
provancheri Ashmead.
rileyi Fox.
shawii Rohwer.
tenax Fox = Diphlebus.
tinctipennis Cameron.
virginiana Rohwer.

PREPARATORY STAGES OF HOMOPTERA UNILINEATA.

By Howard L. Clark, Bristol, R. I.

Eggs.—Obtained from two females taken at sugar and deposited May 25 to 29, 1916. Dia. 1 mm.; shape blunt cone rounded at the apex; irregular vertical ribs as in many of the Catocalas; color bright green, soon changing to dark purple. Some green fluid discharged with the eggs. Hatched June 4 to June 6, making this period nine days.

Young larvæ.—Length 6 mm.; body very slender and thread-like; two anterior pairs of prolegs undeveloped; walk with a looping movement and with great rapidity; very active and refractory. Head prominent, yellowish brown; body greenish gray and almost transparent before the food plant was found. They refused wild cherry, apple, maple, oak, birch, tulip, rose, violet, privet, lilac, and hickory; at last they were offered ordinary locust, *Robinia pseudacacia.* This they seized upon eagerly and devoured voraciously, the green showing clearly through the transparent skin.

At this period all were confined in a large battery jar with a cheese cloth cover. From this many would suspend themselves when not eating. Later about half of them were transferred to an ordinary breeding cage with dirt on the bottom. It became impossible to detect any regular succession of moults, as the larvæ developed at very different rates and gave little evidence, either in their habits or exuviæ, of when these changes occurred.

June 11. No moult detected yet but the larvæ had increased a great deal in size. Length 8 mm. Body still slender and tapering, especially posteriorly, shining and transparent. Head yellow with groups of black spots at the sides of the jaws. Small black tubercles, each emitting a single black hair, scattered over the body. The head also bristles with black hairs. A broad creamy colored lateral stripe and other narrower ones indicated. Thoracic segments pinkish, middle of the body bright green, presumably the food showing through. Posterior extremity light, fleshy and transparent. Two anterior pairs of prolegs entirely absent. Distance from the thoracic legs to the third and fourth pairs of prolegs long.

June 14. Another moult must have been passed, although there were no head cases nor old skins to be found. Length 12 mm. Head pinkish cream color, heavily gridironed with a network of dark brown lines. Rudiments of the two anterior pairs of prolegs appeared. Thoracic segments pinkish brown, rest of the body dull green, shading again to pinkish brown posteriorly. Longitudinal lines and piliferous warts about the same as before.

June 18. No evidence of a moult except that the larvæ had changed conspicuously in size and structure. Length 25 mm., but still very slender and in general appearance much like a *Catocala* larva. Two anterior pairs of prolegs about half developed; all four pairs light flesh color dotted with black. A distinct dorsal hump on the 11th segment and also an enlargement on the 4th segment. Prevailing color dark green, skin somewhat wrinkled, dark olive below, longitudinal light stripes persist, purplish tinge anteriorly. Spiracles inconspicuous, black edged with white.

June 20. At last a moult was distinctly in evidence with the larvæ varying greatly in size; largest length 35 mm. Head with color and pattern the same. First segment conspicuously swollen and globular in shape. Two anterior pairs of prolegs nearly developed and in use when in rest, but the larvæ still employ the looping method of locomotion. Dark wart-like excrescences on the 4th segment and the conical hump on the 11th quite conspicuous. Prevailing color purple brown washed liberally on the back with splashes of light straw color. Stripes persist and the whole body is finely mottled with white. Below greenish white with a dark brown spot on each segment. Base of black piliferous warts is white. Under a 25 mm. glass the larva with its wrinkled skin looks quite like a small snake. Stigmata still inconspicuous.

June 25. Another moult in process, after which length 60 mm.; body slender and tapering toward each extremity. Greatest diameter 5 mm. Color and marking of the rather small head the same as before. Swelling of the 1st segment subsided. All three pairs of posterior prolegs developed, the anterior pair only abortive. Excrescence on the 4th segment now represented by a dark patch, hump on the 11th shaped like the tooth of a saw, slanting forward, almost perpendicular behind, velvet black, cleft at the top. Beyond the 9th segment the body appears flat and pointed and the anal prolegs extend back almost horizontally when at rest spread like a <. To the naked eye the prevailing color, olive mottled and striped in many shades. Above the line of the stigmata the ornamentation is divided into seven broad longitudinal stripes, the stripe down the middle of the back in light shade, then on each side one darker, one lighter and the lowest almost black. Between each stripe a fine light line, almost white in places. These markings all clearer and more pronounced on the thoracic segments. Color below light with a black ventral stripe broken into a spot on each segment. Under a 25 mm. glass, piliferous spots almost entirely white, still with a single black hair each. Stigmata dark and inconspicuous with no light ring. The whole body appears mottled or marbled in purplish brown and yellow and yellowish green, the dark longitudinal stripes appearing where the dark colors prevail and the light stripes vice versa. The skin wrinkled with a look like that of a snake. No further development was observed and the foregoing represents the mature larva.

By July 4 all but one in the cage with the dirt had disappeared, while those in the battery jar were grubbing in the sand and under leaves and refuse. These had shrunk to half their length. In the course of a few days these larvæ pupated, some in slight cocoons of frass and sand and others bare upon the surface. Evidently in nature pupation takes place underground.

Pupa.—Length 23 mm.; diameter 7 mm. Length of thorax and wing cases 11 mm. Main cremaster short and thick with a round hook almost closed. Two or three much smaller auxiliaries with ends wound up like watch springs. Color dull brown in some cases inclining to mahogany. Stigmata visible with a strong glass. On the whole the pupæ looked singularly small. Larval period average 30 days.

April 26, 1917. Two moths emerged, making the pupal period 295 days, which was extended to May 14, when the last moth appeared. From some 50 or 60 well-grown healthy-looking larvæ only 14 moths were obtained, 4 males and 10 females.

None of the specimens were as large as some which had been taken on the wing. All typically marked and colored, and very uniform in their appearance.

TWO NEW VARIETIES OF CICINDELA TRANQUEBARICA FROM CALIFORNIA.

By H. C. Fall, Pasadena, Cal.

I have this season received two forms of *C. tranquebarica* from the Owens Lake region of California which cannot well be included under any of the numerous varietal names already proposed, and which seem quite as worthy of names as any of the forms at present listed.

The giving of distinctive names to slight variations—color or otherwise—is a form of diversion which may be easily overdone, but which seems more defensible than usual in *Cicindela* because of its great popularity with collectors, who almost invariably segregate the readily distinguishable forms in their cabinets, for which purpose and for facility in exchanges the varietal names are a decided convenience.

C. tranquebarica var. **inyo** n. var.—Moderately brilliant green, varying through duller green to deep blue (type blue green). Markings broad and complete, nearly as heavy as in average *Kirbyi*. Beneath entirely blue green.

Olancha, California. April and May. Collector, G. R. Pilate.

C. tranquebarica var. **owena** n. var.—Same as the preceding except in color, which is black, the elytra with faint deep greenish reflections at sides in most examples. Markings similarly heavy and complete; body beneath blue green as before.

Olancha, California. Late May and June. (G. R. Pilate.)

These two forms are evidently seasonal, at least to a certain extent. Mr. Pilate writes me that only green and blue examples were seen in the early part of the season, while by June 1st these had entirely disappeared and the black form alone was present.

Inyo is evidently closest to the form *viridissima,* but the latter is typically of a more vivid green, always with narrower markings, the humeral lunule frequently interrupted.

IN QUEST OF DINAPATE WRIGHTII.

By J. O. Martin, Pasadena, Cal.

About a year and a half ago Mr. H. C. Fall, of Pasadena, first showed me the single specimen of *Dinapate wrightii* in his very complete collection of North American coleoptera. I at once determined to try to add this rare and unique beetle to my collection of California coleoptera which was then just started. I also hoped to make some further study of its life history.

Dinapate wrightii was first described by Dr. George H. Horn,* from fragmentary specimens sent him by W. G. Wright, of San Bernardino, who discovered the species in Palm Canyon, on the northwestern border of the Colorado desert. Mr. Wright gave the locality as Mojave desert, no doubt wishing to keep the fruits of his discovery for himself and for eleven years he was successful. Just how many specimens he secured during this period I have been unable to find out; but certainly not many. Eleven years after Horn's publication of the species came Mr. H. G. Hubbard's letters to E. A. Schwarz† in which he announced its rediscovery, giving the true locality, its food plant and many interesting facts concerning its life history. The food plant turned out to be the Washington palm (*Neowashingtonia filifera*), which is found, in the United States, only in the canyons at the head of the Coachella valley in southern California.

April 14, 1916, I packed my camping outfit in the automobile and set out for Palm Canyon one hundred miles east of Pasadena. The roads were in very bad shape, owing to the unusually heavy rains of that winter, and it took all day to make what is usually a five-hour trip, but night found us in camp at the mouth of the canyon. The next morning I began a search of the canyon, going as far up as the palms extended, without finding a tree which fulfilled the conditions described by Hubbard. He says: "I am sure now that they do not oviposit in bare trunks or in healthy trees, although it is possible that the beetles kill the tree in which they oviposit their eggs."† May 15, one month later, I was back again, determined to search the neighboring canyons which contain palms. This was carried out, but in Andreas and Murray canyons I saw no dead palms of any description and was obliged to force myself through thorny brush and cactus, over fallen trees, just as Hubbard had done eleven years earlier.

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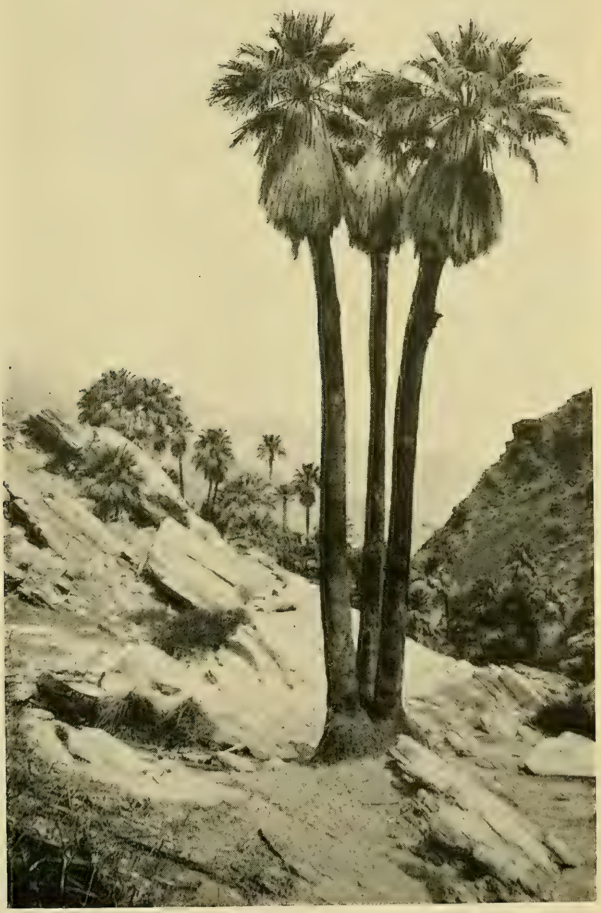
* Trans. Am. Ent. Soc., Vol. XIII, p. 1, January, 1886.

† Ent. News, Vol. X, p. 83, April, 1899.

Finally I returned to Palm Canyon and examined all of the bare fallen trunks of which I had noted several in my previous search. It is not an easy matter to chop into one of these palm trunks even when they have been dead for years, but I worked two days at it without success and was about to despair when a stroke of my axe turned out a larva about three fourths of an inch in length which I thought might be that of *Dinapate*. By placing my ear against the log and keeping very still I could hear others gnawing away inside with a click like that produced by snapping the nails of the thumb and first finger together. However, it was clear that if this was the larva of *Dinapate* it must grow at least a year before it would be as large as that described by Horn, so I decided to wait until the following spring before carrying out the plan which I had in mind.

This last spring (1917), I again went to Palm Canyon, sawed out of the prostrate trunk four two-and-a-half-foot lengths, taking them where the gnawing sounded most frequent and packed them out to my automobile, a distance of about two miles. Another section of this log was later obtained by Mr. J. R. Campbell, of the U. S. Bureau of Entomology. A week's further search of the various groups of palms failed to show any other possible host tree. In sawing the log into transportable lengths the saw disclosed several larvæ in the various cuts, two of which it bisected. The ones which were uncovered but not cut soon bored their way into the log and out of sight. However I was much surprised to find that there were evidently two separate broods of larvæ in the log, one apparently full grown and ready to pupate as shown by the presence of one pupa, the others about three fourths of an inch long. I am convinced that the larvæ seen last year are the ones now full grown and that the smaller specimens represent a brood deposited since the discovery of the log.

This log when discovered was full of sap and showed every



Palm Canyon, Home of Dinapate Wrightii

evidence of having been torn up by the winter flood which this year was the heaviest in over forty years. There were no leaves attached and its size showed it to be one of the older trees, the leaves of which were burned off by the Indians.

On getting my ten feet of log home I at once constructed two stout cages for their reception and then came a long wait. Every morning on arising since March when the sections of log were brought home, my first duty has been to inspect the cages. Not until August 3 was there any change and then my long watch was rewarded by my first sight of a living *Dinapate*. A fine pair, lady and gent, had emerged during the night and were vainly trying to conceal their huge bulks ostrich-wise by shoving their heads into any dark corner. Since then until the present date, September 17, thirty-one of these beetles have emerged, generally one at a time, but one morning there were four and several times two came together. At first the sexes were quite evenly represented but during the last two weeks only females have emerged.

All of these emergences took place after dark in the early part of the night not later than 9 P. M. Several times I tried to see the beetles come out by the aid of a lantern, but the presence of a light caused them to cease operations at once. One evening, however, I was able to watch this process by setting the lantern four feet away; the light was dim but sufficient for observation by close attention. When first observed this beetle had cut through the outer surface and had made a hole about one fourth inch in diameter. This hole he continued to enlarge with his powerful mandibles turning continuously from right to left as he bit away at the circumference. After about half an hour of this circular gnawing he tried the hole, starting out venter down, but as he could not get his thorax through he retreated and took several bites, evidently with an exact knowledge of the spots that bound. He then tried his work and finding it to his liking backed in again and after a short rest turned belly up and came out headed up the log, which he at once ascended to the top. On coming out these beetles are hardened and fully colored and had evidently spent some time in the pupal chamber in the adult condition. They at once begin trying to fly and spend their strength against the wire netting of the cage, the sexes paying no attention to each other, from which I surmise that they seek mates from some other brood. When daylight comes they try to hide, putting their head into any dark corner, where they remain all day without motion.

The males and females are easy to distinguish by the characters given in Horn's description but I note a further sexual character in the granulation of the elytra; in the males the lateral margin and the tip behind the tubercles is smooth, while in the females this area is distinctly granulated. Also a slight difference in the shape of the thorax, that of the males being broader. The males also have a more shining black appearance than the females.

I have now thirty-six specimens of *Dinapate wrightii,* fourteen males and twenty-two females. I can still hear the second brood at work and hope to have more emerge next year.

A KEY TO THE SPECIES OF THE GENUS CERESA A. & S. OCCURRING NORTH OF MEXICO AND THE DESCRIPTION OF A NEW SPECIES (MEMBRACIDÆ: HOMOPTERA).

By Edmund H. Gibson and Emma Wells, U. S. Bureau of Entomology.

To the novice the genus *Ceresa* represents a very puzzling group of insects of the family known as tree-hoppers, and even to the systematist it has its difficult problems. From the study of specimens in the U. S. National Museum and material generously loaned by Mr. W. D. Funkhouser the authors have been able to establish the following key to the species. In offering it as a guide in the identification of species it must be stated that it is nearly impossible to make determinations without having at hand a goodly series of specimens and a collection of all the members of the genus, to be used for comparison.

Ceresa was described by Amyot and Serville in 1843. The logotype of the genus is *vitulus* Fabr. *Ceresa* may be distinguished from *Stictocephala* Stål, its closely allied genus in North America, by having the pronotum distinctly armed with suprahumeral horns and the metopidium acutely angled. The formation of the last abdominal segment of the male differs markedly in the two genera.

Key to the Species of the Genus Ceresa A. and S. Occurring North of Mexico.

1. Pronotum banded .... 2.
   Pronotum not banded .... 3.
2. Broad pale spot in middle, narrower one near apex of pronotum, *diceros* Say.
   Apex of pronotum with apical band only .... *albescens* Van D.
3. Suprahumerals reduced to an angle .... 4.
   Suprahumerals produced in a horn or tubercle .... 5.
4. Length of head greater than metopidium measured from line drawn through suprahumerals to anterior border of face, *femorata* Fairm.
   Length of head less than metopidium measured from line of suprahumerals to anterior border of face .... *uniformis* Fairm.
5. Lobes of last ventral segment of female distinctly and evenly rounded, *brevicornis* Fh.
   Lobes of last ventral segment of female not distinctly rounded .... 6.
6. Base of notch in last ventral segment of female broad .... 7.
   Base of notch in last ventral segment of female not broad, acute ... 8.
7. Suprahumerals only slightly curved backward ..... *albido-sparsa* Stal.
   Suprahumerals quite long, very acute, strongly curved backward and slightly upward .... *constans* Walk.
8. Borders of face more or less rounded, clypeus blunt, not at all produced, contiguous with sides of cheeks .... *occidentalis* Funkh.
   Borders of face more or less straight; clypeus acute and produced, only seldom contiguous with sides of cheeks .... 9.
9. Inner margins of lobes of last ventral segment of female not at all sinuate .... 10.
   Inner margins of lobes of last ventral segment of female more or less sinuate .... 11.
10. Suprahumerals strongly curved backward, long. Contour of cheeks rounded .... *brevitylus* Van D.
    Suprahumerals short, reduced to a short tubercle .... *brevis* Walk.
11. Venter black .... *basalis* Walk.
    Venter yellow or green or brownish .... 12.
12. Clypeus prominently produced .... 13.
    Clypeus somewhat produced but not prominently so .... 15.
13. Very narrow, long species .... *militaris* n. sp.
    Somewhat stout species .... 14.
14. Inner margins of last ventral segment of female sloping. Plates of male long .... *palmeri* Van D.
    Inner margins of last ventral segment of female steep. Plates of male short and stout .... *borealis* Fairm.

15. Metopidium flat or slightly rounded between suprahumerals when viewed from above ....*bubalus* Fabr.
    Metopidium feebly bisinuate when viewed from above .... 16.
16. Species small, suprahumerals curving upward and backward, *taurina* Fh.
    Suprahumerals only slightly recurved ....*stimulea* Van D.

The following distributional groupings and list of food plants should aid in the recognition of the species.

Canada—*bubalus* Fabr., *diceros* Say, *basalis* Walk.

New England States—*albescens* Van D., *bubalus* Fabr., *brevitylus* Van D., *taurina* Fh., *constans* Walk., *palmeri* Van D., *borealis* Fairm., *brevis* Walk., *brevicornis* Fh., *basalis* Walk.

Atlantic and Gulf States—*albescens* Van D., *bubalus* Fabr., *brevitylus* Van D., *taurina* Fh., *constans* Walk., *borealis* Fairm., *brevis* Walk.

Central States—*albescens* Van D., *bubalus* Fabr., *stimulea* Van D., *constans* Walk., *militaris* n. sp., *palmeri* Van D., *borealis* Fairm., *brevis* Walk., *uniformis* Fairm.

North Central States—*diceros* Say, *albescens* Van D., *bubalus* Fabr., *stimulea* Van D., *taurina* Fh., *brevitylus* Van D., *constans* Walk., *basalis* Walk.

Southern States—*diceros* Say, *albescens* Van D., *bubalus* Fabr., *borealis* Fairm.

Western States—*bubalus* Fabr., *stimulea* Van D., *occidentalis* Funkh., *borealis* Fairm., *albido-sparsa* Stål, *basalis* Walk.

Southwestern States—*diceros* Say, *bubalus* Fabr., *brevitylus* Van D., *stimulea* Van D., *palmeri* Van D., *brevis* Walk., *brevicornis* Fh., *occidentalis* Funkh., *basalis* Walk.

The known food plants of the species are here listed. Many of the species are not restricted to a single or few food plants, in which case the principal ones only are given.

Alfalfa: *occidentalis* Funkh., *bubalus* Fabr. Apple: *bubalus* Fabr., *taurina* Fh., *borealis* Fairm. Basswood: *constans* Walk. Cherry: *bubalus* Fabr. Cotton: *borealis* Fairm. Cottonwood: *bubalus* Fabr. Elder: *borealis* Fairm. Hickory: *brevicornis* Fh. Iris: *borealis* Fairm. Maple: *bubalus* Fabr. Oak: *brevicornis* Fh., *palmeri* Van D., *taurina* Fh., *diceros* Say. Pear: *bubalus* Fabr. Potato: *bubalus* Fabr. Quince: *bubalus* Fabr.

Ceresa militaris n. sp.—Near *C. palmeri* Van D., but much narrower, a smaller species. Much longer in proportion to its width than *palmeri*. May be recognized by the long slender pronotum, narrow metopidium and very long sharp plates of male and female.

Bright green with brown and black markings, face yellow. Form long and very slender, metopidium convex, suprahumerals long and acute, posterior process slender and decurved; clypeus acute. Punctate, but only slightly if at all pubescent.

Head yellow-green, longitudinal striæ on face; clypeus triangular at apex, tip densely pilose with white hairs; ocelli translucent with orange borders, situated slightly below a line drawn through center of eyes, somewhat closer to each other than to eyes; eyes brown, extending beyond sides of pronotum.

Pronotum green, densely punctate, very slightly pubescent, ascending nearly straight above head, convex just before suprahumerals, feebly arcuate in middle, dorsum somewhat flattened, semicircular impression very faint; median carina percurrent; humeral horns long and acute, with brown and black markings underneath, extending outward and backward; front of pronotum having long, transverse smooth irregularly-shaped areas dorsomesad of eyes, these areas yellow and shining; posterior process long, slender, sharp, much decurved, reaching to tip of abdomen in females and beyond in males, with brown markings.

Wings smoky, lightly punctate at base, veins brownish. Under surface of body yellow; last ventral segment of female very deeply and roundly notched, base of notch not as broad as *constans* Walk. Ovipositor extending beyond abdomen in a long narrow process. Plates of male broad at base and tapering to a sharp point, very long, extending beyond pygofers, tipped with black. Legs yellow, with white hairs; tarsi and claws somewhat ferruginous.

Described from five females and six males in the collection of the senior author, collected by him at Charleston, Mo., June 19, 1916. Type, allotype and three paratypes deposited in the U. S. National Museum.

References necessary for study in this group:

Fairmaire—Rev. Memb., pp. 284, 289, 1846.
Fitch—*Ceresa brevicornis,* 3d Rep. Ins. N. Y., pp. 177, 335, 451, 1856.
Funkhouser—*Ceresa occidentalis,* Ent. News, Vol. XXVI, p. 100, 1915.
Marlatt—Buffalo Tree-Hopper, Bur. Ent. Cir. 23, 2d Ser., 1897.
Say—Long's Exped. App., p. 299, 1824.
Stal—*Ceresa albido-sparsa,* Eug. Resa Omk. Jord. Hem., pp. 86, 283, 1856.
Walker—*Ceresa brevis,* List of Hom. B. M., pp. 528, 563, 1851.
Van Duzee—List of Hem. taken by W. J. Palmer about Quinze Lake, P. Que. in 1907. Can. Ent., Vol. LX, p. 112, 1908. Studies in N. A. Mem. Buffalo Soc. Nat. Sci., 1908, Vol. IX, pp. 35, 36. Florida Hemiptera Buffalo Soc. Nat. Sci., Vol. IX, p. 205, 1909.

A NEW GENUS OF ANTHOMYIIDÆ (DIPTERA).

By J. R. Malloch, Urbana, Ill.

The genus herewith described belongs to the subfamily Anthomyiinæ though in some respects it resembles Phaoniinæ. It differs from all other genera of the family known to me in having a single long bristle near the upper margin of the pteropleura just below the base of the wing. Recent attempts at a classification of the order have shown a tendency towards the use of the chætotaxy of the pleuræ as a distinguishing character in separating the families Muscidæ and Anthomyiidæ. If the absence of bristles or hairs from the hypopleura and pteropleura separates Anthomyiidæ from Muscidæ, then many typical species of the former family will require to be placed in Muscidæ. Besides the genus now under consideration the genus *Lispa* (subfamily Lispinæ), several species in *Phaonia,* and at least one in *Eremomyia* have hairs or bristles either on the hypopleura or pteropleura. The presence or absence of these hairs or bristles, while of considerable importance in a general way, does not invariably serve as a basis for the separation of the families Anthomyiidæ and Muscidæ.

Emmesomyia gen. nov. Generic Description: *Male.*—Eyes very large, separated by a narrow stripe consisting of the orbits only on the upper half of its length; ocellar bristles long, directed forward. Abdomen narrow, slightly flattened; hypopygium of moderate size, terminating in a recurved hook-like process; apical ventral segment deeply excised centrally; first segment with very strong bristles on middle laterally. Legs and wings similar to those of female.

Female.—Eyes separated by one third the head width; cruciate frontal bristles present; orbitals 5 in number, the median one directed forward; antennæ elongate, third joint much longer than second, rounded at apex; arista hairy; proboscis and palpi normal. Thoracic chætotaxy similar to that of *Hylemyia,* differing only in having a strong bristle on the upper margin of the pteropleura. In other respects similar to *Hylemyia* except that the third vein has several setulæ at base, both above and below.

Type, *Emmesomyia unica,* n. sp.

Emmesomyia unica n. sp. *Female.*—Black, densely covered with pale gray pruinescence. Frons and face with dense whitish pruinescence, that on orbits slightly silvery; antennæ black, basal 2 joints rufous; apical portion of proboscis glossy black; palpi yellow. Mesonotum slightly yellowish behind humeri, and with 4 blackish vittæ on the anterior portion of disc, the inner pair rather widely separated, narrower than the outer pair and not extending caudad of suture; center of disc with a distinct yellowish longitudinal streak, scutellum yellowish at apex. Abdomen with basal segment yellowish on each side of dorsum and usually some yellow markings on some of the other segments. Legs reddish yellow, mid and hind legs with the coxæ and tarsi infuscated. Wings clear. Squamæ white. Halteres whitish yellow.

Frons one third the width of head, slightly narrowed posteriorly; third antennal joint nearly three times as long as second, rather broad; arista slender, basal joint very short, hair moderately long; cheeks not as high as width of third antennal joint, marginal bristles sparse but very strong. Mesonotum with 3 postsutural dorso-centrals; 2 pairs of strong acrostichals proximad of suture, prealar bristle half as long as the one behind it. Strong bristles on abdomen confined to apices of segments. Fore tibia with 1 strong bristle on middle of posterior surface; mid tibia with 3 bristles, 2 on postero-dorsal surface and 1 on posterior close to the lower one of the former pair; hind tibia with 2 postero-dorsal, 3 antero-dorsal, and 2 antero-ventral bristles. Costal spine very short; last section of fourth vein but little longer than preceding section.

Length, 6.5–7 mm.

Type, Savoy, Ill., May 23, 1916. Paratypes, Algonquin, Ill., June 12, 1897 (Nason), Homer, Ill., June 17, 1917 (Malloch).

I captured the type specimen on the trunk of an apple tree in an orchard at Savoy, near Urbana. Nothing is known of the immature stages.

Emmesomyia apicalis n. sp. *Male and Female.*—Differs from the foregoing species in having the antennæ and palpi black and the mid and hind femora more or less brownish at apices.

Structure and chætotaxy as in *unica*.

Length, 4.5–6 mm.

Type, Dubois, Ill., May 23, 1917. Paratypes, Dongola, Ill., May 12, 1917, Savanna, Ill., June 3, 1917. Allotype male, White Heath, Ill., June 3, 1917. Taken by the writer in sweeping vegetation on margin of woods.

THE GEOMETRID GENUS *BARNESIA*.

In 1910 Mr. Grossbeck proposed the name *Barnesia* for a species from Arizona (Journal N. Y. Ent. Soc., p. 207). It now appears that Barnesia was used as early as 1901 (Ann. Cient. Paraguay) by Bertoni for a supposed new genus of Dendrocolaptid birds. The moth may take the name *Eubarnesia* nov. nom., type *Eubarnesia ritaria* Grossb.

T. D. A. Cockerell.

THE PROBABLE COLOR OF THE ANCESTRAL WINGED INSECTS.*

By G. C. Crampton, Ph.D.

It would appear extremely probable that many (if not most) of the ancestral Pterygotan insects varied from honey-yellow to brown in color. The reasons for so thinking are as follows: (1) Honey-yellow to brown is a common color among the Chilopods, which have departed but little from the ancestral condition of insects in general. (2) Honey-yellow is a common color among the Apterygotan insects, which have departed but little from the ancestral condition of the Pterygotan insects. (3) Honey-yellow to brown is a color frequently occurring in immature insects. (4) Honey-yellow to brown is a common color among the most primitive orders of winged insects. (5) Honey-yellow to brown is a common color in the most primitive representatives of almost all of the orders of winged insects—even of the higher orders!

That honey-yellow to brown is a common color among Chilopods is at once apparent to anyone who examines a specimen of *Scutigera, Scolopendra,* etc., or any of the common Chilopods found under stones or dead wood in the neighborhood. This is not so evident in the case of the Apterygotan insects, however, since so many of them are colorless, due to their habit of hiding in places protected from the sunlight, and their sheltered habitats make it unnecessary for them to develop a harder protecting chitinous armor, which is always more deeply pigmented than thinner chitin. Nevertheless "Collembolan" insects, such as *Smynthurus, Orchesella, Deegeria,* etc., have a yellowish or brownish hue, and the more heavily chitinized specimens of *Campodea* are of a honey-yellow color. This shade also occurs in the more strongly chitinized terminal segments of *Japyx,* and I have seen a large Cuban Japygid which is entirely yellowish brown in color. The chitinous sclerites of the tropical Lepismids which live somewhat more "exposed" lives than our

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* Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

Northern representatives of the group, show tinges of a honey-yellow color, and from the foregoing instances it is evident that the "honey-yellow to brown" hue is of widespread occurrence among those forms which have departed but little from the ancestral condition of winged insects.

Honey-yellow to brown is a color frequently found in the immature stages of the lowest Pterygotan insects such as the Blattids and Plecoptera, and it is also very widespread among the larvæ of the higher forms, such as Coleoptera, Lepidoptera, Siphonaptera, etc. Taken alone, this fact has no especial significance, but in connection with the other instances here cited, it lends additional weight to the view that the color in question is a very widespread and primitive one.

Honey-yellow to brown is a very common color in the lowest representatives of the winged insects, such as the Blattids, Mantids, Isoptera, Plecoptera, Embiids, Dermaptera, Grylloblattids, Phasmids, etc., and this fact should have considerable weight in such a discussion. The most convincing feature, however, is that the most primitive representatives of almost all of the orders seem to be of this color. *Grylloblatta,* which is one of the most primitive representatives of the "Orthopteroid" insects, is of a honey-yellow hue, and the same is true of *Ithone,* the most primitive of the Neuroptera. The same color occurs in *Merope,* which is an exceedingly primitive Mecopteron, and the "honey-yellow to brown" color is very common among the Tipulids and other primitive representatives of the Diptera. I have been unable to examine the most primitive representatives of all of the insectan orders, but the color in question occurs in so many of the lowest forms which I have been able to examine, that I feel confident that some, at least, of the most primitive representatives of all of the orders will prove to be of a honey-yellow to brown color, if the matter is investigated with this in view.

A "blackish" shade is also very common among certain primitive insects (*e. g.,* Plecoptera, Embiids, Gryllids, Collembola, etc.), and a "grayish" tint occurs among many of the Apterygotan insects, being apparently a relic of their relationship to the Isopod Crustacea, but the varying shades of brownish yellow to brown are far more common among the Pterygotan insects, and, from the above-cited evidence, I feel confident that a more thorough study of the matter, based upon the examination of more of the primitive representatives of each order than are at present available for study, will merely confirm the contention that "honey-yellow to brown" was the prevalent color among the ancestral Pterygotan insects.

NOTES ON HYMENOPTER~~E~~A PARASITICA.

By A. A. Girault, Glenn Dale, Md.

Hypopteromalus percussor n. sp.—Female: Like the genotype but differs as follows: the femora are metallic at proximal half (caudal ones nearly entirely metallic), the flagellum is darker. Types compared.

From two females reared from the larvæ of *Zotheca tranquilla,* Wenatchee, Wash., June 22, 1916 (E. J. Newcomer). Types: Cat. No. 20,970, U. S. Nat. Mus., the females on tags, hind tibiæ and heads on a slide.

Eupteromalus sarcophagæ Gahan.—Differs from *Meroporus utibilis* Tucker in having the distinct lateral carinæ on the propodeum and the much longer than wide propodeal spiracle (mandibles not compared nor other parts); from *Halizoa rufipes* Ashm. in the cylindrical antennæ, lesser size and perhaps otherwise; from *Meraporus dubius* Ashm. not at all. Types compared.

Neomphaloidomyia n. gen. Tetrastichini.—The same as *Neomphaloides* but the scutum without a median groove, the antennæ with four ring-joints (1 and 4 large, equal). Stylus of abdomen very long, nearly as long as the ovipositor, which is extruded for a length equal to two thirds of the abdomen and is no wider than the stylus (*i. e.,* it's valves are not). Tooth 3 of mandible truncate. Male scape compressed, with fine, sharp saw-teeth along its ventral margin, 4 funicle, 3 club and ring-joints. Genotype: *Hyperteles polynemæ* Ashm.

Neomphaloidella irvingi n. sp.—Female: Similar to *Aprostocetus canadensis* Ashm., but differing notably in that the funicle joints are twice longer than wide. Second two ring-joints very short.

One female, Springer, N. M. (C. N. Ainslie). Type: Cat. No. 21,011, U. S. Nat. Mus., the female on a tag, the head on a slide.

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